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Deadline Approaches

Profile of a Typical DPer: Plagued by Image Problems

By Marcy Rosenberg
CW Staff

NEW YORK – While the typical DP professional enjoys his work, is paid a substantial salary and has good advancement opportunities, he is plagued by image problems.

Computer programmers, systems analysts and DP managers alike complain that corporate-level management remains ignorant of the DP function and fails to include DP departments in major company decisions.

This "Profile of the EDP Professional" is based on the opinions of 1,054 DPers who responded to a recent questionnaire asking for their views of jobs, employers and careers as well as for background information. The nationwide survey was conducted by Deutsch, Shea & Evans Inc. (DS&E), a human resources consulting and communications firm here.

Among those sampled were programmers, systems analysts and designers and managers in the DP community. DS&E described its sample population as follows:

- Gender: The overwhelming majority, 87%, were male.
- Age. About 2% were under 25, half were between 25 and 34, 32% were in the 35 to 44 age range, some 11% were between 45 and 54, and about 4% were 55 or older.
- Education: 95% attended college. Of these, 47% held B.A. or B.S. degrees; 26% received master's-level degrees, 41% did some postgraduate work, 19% had not completed their degrees.
- Work responsibility: Programming was the primary job function for 43% of the sample, for 32%, systems analysis, 21% said systems design, and 14% were in management.
- DP application area. 23% worked in business or financial organizations and an equal percentage in industry. 21% were from government sectors, and 20% worked in DP manufacturing and service companies.

(Continued on Page 8)

Service Can Help Prove Wage and Price Compliance

By Don Leavitt
CW Staff

ANN ARBOR, Mich. – Large businesses faced with a mid-February deadline for showing compliance with President Carter's wage and price standards may be able to meet that deadline with a time-shared system now available on Comshare, Inc.'s remote computing network.

Businesses with annual sales of more than $500 million must demonstrate compliance with the guidelines by reporting to the federal Council on Wage and Price Stability by Feb. 15. By that same date, businesses with sales of more than $250 million must "prove their intent and method of compliance" to the council, a Comshare spokesman said.

Even companies that intend to bid on government contracts worth more than $5 million are required to advise the council of their intentions by mid-February, he added.

The reporting involved in meeting

(Continued on Page 6)

Survey of 42 Cities Finds

Mayors Unhappy With Automation

By Brad Schultz
CW Staff

IRVINE, Calif. – Many U.S. mayors and city managers are disappointed with the results of computerization. For most cities, the transition from manual to automated procedures has raised operating costs, made government less responsive to citizens and disrupted political relationships.

That was the finding of a Public Policy Research Organization (PPRO) study of DP in 42 cities conducted by PPRO Urban Information System (Urbis) Research Group investigators.

Although computing has improved the technical quality of and access to information used by local government officials, the information is often incomplete and only partly helpful, the study's final report stated.

The chief executives had expected automation to enhance their control of the agencies under them, but control-oriented applications usually consist of listings and comparisons of inputs (in terms of effort and dollars) rather than outputs (the outcomes of activities), Urbis found. Top managers therefore know how much agencies have spent without knowing whether the money was spent well.

Other Complaints

City managers also reported that computer systems are only "somewhat helpful" when applied to salary negotiation, budget making, spending control and other finance activities. Outside the area of finance, few automated applications have been designed to meet the management needs of local government, the report said.

For example, systems do not greatly assist municipal planning because this type of decision making relies on "broad-based" data about community conditions. Automated monitoring of those conditions is narrowly focused on a small number of the variables worth considering, the report found.

(Continued on Page 6)

Lasers From Exxon Eyed For Optical Transmission

By E. Drake Lundell Jr.
CW Staff

NEW YORK – Semiconductor lasers that may have future DP applications in optical transmission and peripherals were introduced by a subsidiary of Exxon Enterprises, Inc. last week. The family of aluminum galium arsenide "striped double-heterostructure semiconductor lasers" are aimed primarily at the two DP areas, according to a spokesman for Optical Information Systems, a subsidiary of Exxon Enterprises, Inc.

"The impact of the semiconductor laser on optical technology will be comparable to that of the transistor on the electronics field," according to Michael H. Coden, manager of Optical Information Systems.

To date, the largest problem with communications over fiber-optic systems has been the quality of the light source, one laser industry observer pointed out last week. While he would not agree with Coden's statement, he said "the announcement is important, just not *that* important."

The new devices from Exxon are at the high end of what is presently available, in both quality and cost, and could go a long way toward meeting those light quality problems – if they live up to their billing. Therefore, Exxon should be able to carve out a place in that field, and the Exxon devices should speed up applications of fiber optics for communications, he noted.

Optical Disks

The other major, immediate application area for the laser devices would probably be in the optical disk arena, which promises to offer users substantially increased storage densities with about the same data rates as present high-speed disks.

Magnetic disks now have the capacity to store about 250,000 bits per square inch, Coden pointed out, but the optical disks that several firms are researching show a promise of storage densities of up to 360 million bits per square inch.

Another possible application will be

(Continued on Page 8)

'Not a Whiz Kid'

By Jeffry Beeler
CW West Coast Bureau

BERKELEY, Calif. – Teenage vandalism spilled over from the streets and into a local computer room recently when a 15-year-old boy apparently committed the DP equivalent of tire slashing and hubcap stealing.

For more than a year, the youth allegedly used the University of California's computer facilities here without authorization and repeatedly disrupted some of the school's DP operations. University police have charged the boy, whose name is being withheld because of his age, with felony, vandalism and grand theft of 200 hours of computer time worth an estimated $10,000.

After being detained briefly by police, the boy was returned to his mother's custody. Police then referred the case to the Alameda County Probation Office for a decision on the boy's fate.

As a juvenile and a first-time offender, however, the boy is not expected to stand trial, and police predict he will escape the incident with

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Please address all correspondence to the appropriate department at 797 Washington Street Newton, Mass. 02160. Phone (617) 965-5800. Telex USA 92-2529.

OTHER EDITORIAL OFFICES: Washington, D.C.: 821 National Press Building 529 14th Street N.W. Washington D.C. 20045 Phone (202) 347-6718. **England:** Tony Vickers IDG Publishing Ltd. 140-146 Camden Street London NW1 9PF Phone 01-267-1201 Telex 851 264737. **W. Germany:** Hans Jurgen Ballnath Computerwoche c/o CW Publikationen Friedrichstrasse 31 8000 Munich 40 Phone (089) 34 90 01 Telex 5215350. **Asia:** Hidetsuna Sasaki Computerworld c/o Dempa Computerworld Company Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku Tokyo 141 Phone (03) 445-6101 Telex J2424461. **Australia:** John P. Costello Computerworld Pty. Ltd. 3 Bruce Street Crows Nest NSW 2065 Phone 929-5388 Telex SECCO AA25468. **Brazil:** Eric Hippeau Data News, c/o Computerworld do Brasil Servicos e Publicacoes Ltda. Av. Rio Branco 156 Sala 1222 Rio de Janeiro ZC-21 Brazil Phone 242-7395 Telex 212-1507. **Iran:** Shapour Namazi, Mideast Computer Ferdowsi Avenue Tehran, Iran Phone 310251 Telex (051)212467.

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Similar to X.25

Federal Network Standard Adopted

By Ronald A. Frank
CW Staff

WASHINGTON, D.C. — Government agencies will soon be configuring data communications networks that are similar to the X.25 international standard.

The Federal Telecommunications Standards Committee approved the bit-oriented Advanced Data Communications Control Procedures (ADCCP) protocol early this month, a few days after it was given final sanction by the Board of Standards Review at the American National Standards Institute (Ansi). The result of these dual approvals is Federal Standard 1003 and Ansi standard X3.66-1979.

The federal standard requires agencies now implementing networks to utilize ADCCP. Nets being configured with character-oriented and other procedures, however, are not bound by the ADCCP requirement, a federal spokesman said.

The Federal Telecommunications Standards Committee had been anticipating the final adoption of ADCCP for several years, and the approval should not have caught any agency by surprise, the spokesman said. The committee includes members from the Department of State, Department of Defense, Department of Commerce, National Bureau of Standards, Library of Congress and General Services Administration. It reportedly represents all major government agencies with a need for telecommunications.

Reasons for Adoption

ADCCP was adopted for federal use because it was considered to be a more comprehensive protocol than others now being used. Specifically, the protocol's multidrop capabilities, multiple octet addressing scheme and extended sequence numbering were judged desirable by government telecommunications experts.

Many of ADCCP's features make it ideal for satellite links, and one federal expert said ADCCP features would probably be adopted for future commercial networks.

The protocol was also considered desirable because it was based on an industrywide effort and did not put the government in the position of adopting a synchronous protocol pioneered by a single industry supplier, he added.

The staff work leading up to the final adoption was completed by personnel at the National Communication System who acted for the Federal Telecommunications Standards Committee until that group took the final vote in mid-January.

Links to HDLC

ADCCP is considered to be a discrete protocol and is separate from High-Level Data Link Control (HDLC), which is the cornerstone of X.25. However, federal standards experts feel the differences between the two are not significant enough to prevent an ADCCP network from interfacing with an X.25 network if that is desired some time in the future.

"Subsets of ADCCP will talk to HDLC and the Link Access Procedure B of X.25," one standards expert said, adding that only "fine-grain details" separate the two

Because adoption of ADCCP had been expected, at least four networks being implemented by federal agencies will use the protocol. One is the Automated Digital Information Network, better known as Autodin II, operated by the Department of Defense; another is a network run by the National Weather Service.

The other two nets are still in the procurement cycle and their names have not yet been publically announced.

The concepts which led to the protocol adopted this month were introduced before the Ansi X3S34 study group by IBM about six years ago. Various standards bodies within Ansi and the government have since considered aspects of ADCCP and its adoption.

The finalization will be important for vendors who supply data communications equipment to federal agencies. Vendors in this category include IBM, Control Data Corp., NCR Corp., Burroughs Corp., General Automation, Inc., Honeywell, Inc. and Digital Equipment Corp. Each of these firms has developed a non-ADCCP network architecture for use by its customers.

It is believed that most of these architectures will now be modified with an ADCCP link control level.

Correction

In Part 3 of "The New Software Economics," a word was omitted from the sixth paragraph on In Depth/7. The sentence should have read: "Personal communications with Phister indicated that general and administrative costs had not been included in the figures so that perhaps one is entitled to reduce the gross profit by another 10 points, which at 43% to 59% still appears high."

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Took Kickbacks From DP Lessors?

Phone Company Exec Charged With Bribery

By Marcy Rosenberg
CW Staff

DALLAS — After 35 years with Southwestern Bell Telephone Co., Ray A. (Pete) Acker, recently retired vice-president of data systems, now faces a 10-year prison term for allegedly taking part in a bribery-conspiracy scheme said to have cost the utility more than $1 million.

Acker has been charged in federal court with accepting bribes and kickbacks from brokers, financial companies and computer leasing firms in exchange for his help in winning them contracts to supply Southwestern Bell with computer and copying equipment from 1974 to 1978.

The U.S. Attorney's Office here also filed two related charges of income tax evasion against the former Bell executive.

Plea Bargain Agreement

Acker, who had pleaded innocent to all charges, recently changed his plea to guilty to the bribery conspiracy allegation and one of the tax evasion charges as part of a plea bargain agreement accepted by Judge Sarah T. Hughes of the U.S. District Court for the Northern District of Texas, Dallas Division.

Under the agreement — signed by Acker, defense attorney Robert Hinton and Assistant U.S. Attorney Jay Ethington — the government will drop the other charge of tax evasion and the federal prosecuter would recommend that Acker be sentenced to no more than 10 years imprisonment or probation or both. The federal charges carry a potential 30-year jail sentence.

However, if Hughes sets a sentence of more than 10 years, Acker has the right to change his plea to not guilty and stand trial, Ethington said.

In addition to the bribery-conspiracy charge, Acker pleaded guilty to allegations that he evaded $454.134 in income taxes on more than $900,000 he received in 1976 as part of the bribery and kickbacks.

The charge the federal prosecutor agreed to dismiss alleged the retired Bell official owed $131,492 in income taxes on $250,000 he received in 1975.

Five Other Men

Not involved in the plea bargain, however, are five other men who are alleged to have conspired with Acker during the four-year period by bribing him to obtain computer leasing contracts with Southwestern Bell.

Scheduled to stand trial before a jury on Feb. 12 are three Dallas businessmen whose companies did business with Southwestern Bell; a Collin County banker who allegedly helped "launder" money for Acker; and an attorney accused of helping with paperwork involved in the alleged bribery scheme.

They are reported to be Irven Eugene Barlow and Richard Reid Wadsworth Jr., officials of Intercap Corp., Dallas, Robert Ancel Palmer Jr., president and owner of International Equipment Financing Corp. of Dallas; Robert Charles Sullivan Jr., former president of the Citizens State Bank of Princeton; and Warren E. Zimmerman, an Amarillo, Texas, attorney said to have a Dallas office.

Acker will be sentenced after the codefendants' trial concludes, Ethington said.

Bribery Scheme

The bribery scheme defrauded Southwestern Bell of about $1.7 million, according to James Rolfe of the U.S. Attorney's Office. The utility, however, did not press charges, a company spokesman said. When asked about estimated losses to the firm, the spokesman replied, "We are the injured third party. We don't know what amounts are involved."

Acker reportedly joined Southwestern Bell about 35 years ago and rose through various management posts to his most recent position as vice-president of data systems. In that capacity, he was said to be responsible for presenting bids and proposals to Southwestern Bell for the lease of computer equipment it used in-house.

The utility had not purchased its computer equipment until 1973 to 1974, when it decided to obtain the equipment through third-party tax leverage leases to save on costs, sources said.

A source close to the case who refused to be identified maintained the bribery scheme was engineered not by Acker, but by a consultant to Southwestern Bell.

The consultant was said to have accepted bribes and kickbacks from financial and leasing companies that he then helped to secure computer leasing contracts with the utility. To accomplish this, he reportedly supplied these companies with inside information, furnished in part by Acker, about the kind of equipment Bell needed and competitive bid amounts.

Acker, 63, retired from Southwestern Bell last spring. When asked if the utility forced his early retirement, the firm's spokesman said, "He retired at his own request."

Teenager Charged With DP Vandalism

(Continued from Page 1)

little or no punishment.

Asked to comment on the case, Dr. Stewart Lynn, the university's director of computing affairs, disputed recent press reports that have characterized the youth as a DP genius who repeatedly outwitted school administrators.

"He's a bright boy all right, but he's not the whiz kid that some newspapers have made him out to be," Lynn contended. Because the university tries to make its computer facilities as "friendly" and available as possible, an unauthorized user can gain access to the hardware with less ingenuity and difficulty than might be expected, he explained.

Lynn declined to reveal all the details of how the youth allegedly bypassed the university's computer security system for fear of encouraging similar incidents here and elsewhere.

He did concede, however, that the boy relied heavily on a portable terminal he purchased secondhand for $60. The youth reportedly used the terminal from his mother's home in nearby Concord, Calif., to communicate over telephone lines with six Digital Equipment Corp. PDP-11/70 minicomputers in the university's computer center.

Part of Outreach Program

The alleged vandalism and theft of computer time occurred while the 15-year-old was participating in a university-sponsored outreach program designed to familiarize high school students with the basics of computer science.

Only about a week after the youth, a student at Concord High School, enrolled in the noncredit course, Lynn and his associates encountered the first in a long series of hitches that noticeably hindered operations in the university's computer center. Hardware began to experience an unusual amount of downtime. Data was inexplicably lost, and users — from among both the university's faculty and its student body — suddenly found themselves unable to run necessary programs.

Before long, university officials concluded the boy was accessing the school's computers without permission and using the stolen time to scuttle ongoing DP activities.

Remote Access

At first, university administrators tried to end the alleged abuse by barring the high school student from the computer center building. But the youth easily circumvented that restriction by accessing the school's CPU remotely through his portable terminal.

Administrators then told the youth "several times" that he could no longer use their hardware, but the boy apparently ignored their warnings, according to Lynn. They also reportedly relayed their warnings to the student's mother, but again to no avail.

Although Lynn declined to elaborate on exactly the kinds of monkey wrenches the boy allegedly threw into the school's systems, he remains convinced that the boy intentionally tried to disturb the university's DP activities. "We were trying to steer him in a constructive direction, but he seemed to be mainly interested in destructive activities," he recalled.

The computing affairs director suspects the youth used his "work" with the university's computer systems as an excuse for shirking his homework.

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CDC Updates Star 100 With 100 Mips Processor

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Control Data Corp. last week reasserted its role as producer of the world's largest mainframe with the introduction of an upgraded version of its Star 100 number-cruncher.

The company described the system, dubbed the Cyber 203, as a segmented, pipeline architecture-type system capable of executing up to 100 million instructions per second (Mips). The design enables the 2M-word system to execute instructions at that speed while simultaneously running its 12 channels at a maximum rate of 40 million bit/sec, CDC said.

The system's basic cycle time is 20 nsec, which company officials believe is the best speed yet achieved on any commercially available system.

The hardware is capable of supporting just about any conventional peripheral, according to a spokesman, but the software support is oriented toward CDC's Star 100 peripheral products.

Possible Front Ends

Systems that could be front-ended to the Cyber 203 include the CDC Cyber 70 and 170, the CDC 6600 and IBM 370s. Huwever, the CDC spokesman stressed the desirability of matching high-speed devices, such as CDC's 819-21 high-speed disk, to the high speed of the processor. He also cautioned that while many devices can be interfaced to the Cyber 203, the lack of software support for some of them means "the cost of developing software would be more than the price of the [intended] device."

The operating system and Fortran compiler for the Cyber 203 are the same used on the company's Star 100. CDC noted that these two pieces of software are subject to continual improvement and evolution. The Assembly language used on the Star 100 is also used on the Cyber 203.

Describing the Cyber 203 as a "computational facility," the spokesman said it was designed to be a component in a distributed-type system oriented to solving complex problems requiring "heavy computational processing." It is more econumical to free the system's CPU from lower-level tasks by using a front-end processor in the Cyber 170 range, which is included in the Cyber 203 purchase price, he noted.

The enhanced speed of the Cyber 203 was its use of vector processing. CDC has implemented an "automatic vectorization" Fortran feature for use with the Cyber 203, the company said.

The machine also makes use of a new virtual memory concept, according to the company. "We've learned how to do the memory management — paging — efficiently, so that now we have the right balance between program simplicity and application performance," a CDC official explaned.

Target Applications

The company has identified weather forecasting, aircraft design, oil exploration and nuclear research as areas of likely application for the Cyber 203.

CDC described the Cyber 203 as the culmination of 10 years of development and said the company has already identified the characteristics of its successor, which will be available in the early 1980s. That system will be compatible with the Cyber 203 and will offer four to eight times the performance.

"Increased parallelism will be the fundamental change in the architecture," the company said. "A component technology change also is likely that will provide a memory expansion capability beyond what is currently offered — perhaps to four or eight milliun 64-bit words," CDC said.

The availability of the latest CDC supercomputer is being quoted at 12 tu 18 months.

The price of a Cyber 203 ranges from $5.8 million to $11.7 million, depending on uptiuns. The basic mainframe with 500,000 (64-bit) words of memury is priced at $5.8 million or $145,000/mu un a one-year lease.

The typical price range for a total system including mainframe, peripherals, front-end processor and software is $8 million to $11.7 million or $180,000/mo to $220,000/mo.

The 10% Factor

WASHINGTON, D.C. — If the Cyber 203 had been available last year, the U.S. could have saved approximately $1 billion of the $5 billion lost in 1978 because of adverse weather conditions.

That claim was made here last week by Paul M. Wolff, president of Global Weather Dynamics, Inc. of Monterey, Calif. Speaking at the press conference at which the Control Data Corp. supercomputer was unveiled, Wulff said the Cyber 203 can provide close to a 60% weather forecasting accuracy.

The present accuracy rate is less than 50%, he added.

Global Weather specializes in forecasting worldwide weather conditions for weather-sensitive industries. It currently uses the Star 100 on CDC's Cybernet remote computing network, which is slated for an upgrade to a Cyber 203.

The Cyber 203 can provide a full 24-huur furecast in about 10 minutes, whereas a Cyber 7600 requires about two huurs to perform the same task, according to Wolff.

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4

U.S. Mayors Found Unhappy With Automation

(Continued from Page 1)

Moreover, the computer tracks were said to be poorly coordinated with each other.

Top city officials find computer systems of virtually no use in allocating manpower or setting goals for the units or individuals they supervise, Urbis said.

City officials expected computing to greatly reduce the numbers of agency clerical personnel, but this also did not happen, Urbis said. Such benefits from automation usually occur in large volume, highly repetitive applications, Urbis explained, and most data used by city agencies is diversified in nature and low in volume.

Nevertheless, many city administrators mistakenly believe computer systems are cutting departmental or citywide expenditures in the long run, the report indicated.

In fact, Urbis found a greater proportion of a city's total budget is allocated to computing than most administraturs anticipate or ever notice. Budgeted expenditures for computing range from .5% in the smaller cities to 6% in the largest cities.

However, budgeted DP exenditures represent only about one-third to one-half of what many cities end up spending on DP in a budget cycle, the report noted. Hence, most cities probably spend 1% to 3% of their total budgets on DP, while the range can extend from 1% for small cities to 12% for major metropolises.

The clouding of municipal DP costs was largely blamed on the practice of burying disbursements for system acquisition, maintenance and development in user department budgets.

Moreover, central computing agencies have recently started to return responsibilities for monitoring DP activities and costs to the users, the report added.

Cities experiencing rapid population growth may be able to justify their DP investments in the long run, but cities with static or declining populations will be hard-pressed to do so, the Urbis report suggested.

The report verified that computer systems are no longer limited to use by large cities and said that by the mid-1970s, more than 90% of U.S. cities with populations exceeding 50,000 employed systems in their government operations. Most cities with populations greater than 25,000 are automated.

Explaining why the Urbis study was undertaken, the report noted the conviction of many social observers that Americans are prone to putting too much faith in technology as a cure-all.

The report suggested that technology not be allowed by government to develop without regard to its social context. According to Urbis, Americans are afflicted by the "moon shot" syndrome — the belief that if technology accumplished the moon shot, it can solve any number of governmental problems.

The governmental problems addressed by technology might well be harder to solve than the engineering problems overcome to reach the moon, Urbis declared. Furthermore, technology sometimes introduces new problems in government.

The automation of U.S. cities may spawn urban bureaucracies that are intrinsically well-managed, but indifferent to the public's needs, Urbis warned.

More Coming

This is the first in a series of articles that will examine computing in local government.

The series is based on a report made available by the Urban Information Systems (Urbis) Research Group, which was established by the Public Policy Research Organization (PPRO), an affiliate of the University of California at Irvine (UCI) through a grant from the National Science Foundation.

The report, entitled *The Management of Information Systems: Implementation Policy for Computing in American Local Government,* was written by Kenneth L. Kraemer, UCI Graduate School of Administration; William H. Dutton, San Diego State University School of Public Administration and Urban Studies; and Alana Northrop of the California State University at Fullerton's Department of Political Science.

Information on how to obtain copies of the report, which will soon be published as a book, is available from Kraemer c/o PPRO, University of California, Irvine, Calif. 92717.

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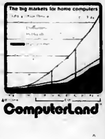

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Service Can Meet Deadline

(Continued from Page 1)

those deadlines is beyond most manual operations and too complex to program in the short time available, the spokesman said. Comshare's system combines data collection, grouping, analysis and reporting facilities and some of the people the company already had available in its Financial Service and Human Resources Management Services areas. The programming logic has been well exercised by many users; the people can keep the coding current with guideline changes issued by the council, the spokesman said.

While the forms of the reports generated by the system are pretty well defined, the data that goes into them is "very definitely under user control." The user determines, for example, what levels of detail within his organization are grouped for averaging and reporting.

Since the percentages of increases allowed for wages or prices are common to all organizations, the programming to compare what actually happened to the guidelines is built into the system.

But the identification of personnel to be excluded from the wage raise averaging — programmers and analysts perhaps, if they are entitled to exemption — is the user's prerogative and responsibility, according to Comshare.

Thus the wage guidelines compliance reports could be produced for individual work gangs under a foreman for one organization using the system, but for whole departments or divisions within a corporation for a different user, the spokesman explained.

Reports might even be generated to distinguish between shifts because pay differentials could confuse honest efforts at compliance, he noted.

Comparable flexibility is available on the collecting of data and reporting of price changes, the spokesman added.

The Comshare system does more than meet the February deadlines, according to Comshare. It provides the means of building and maintaining records to show on-going compliance with the guidelines.

Since Comshare's facilities are accessible nationally, it also simplifies the work needed to collect all the data the council may request. The remote computing service also means that people within a user organization can see how well their unit is meeting the guidelines compared with other units.

The compliance reporting system, which has no more formal name than that, is available at normal time-sharing charges. There is no special startup fee or monthly minimum charge.

Comshare is headquartered at Wolverine Tower, 3001 S. State, P.O. Box 1588, Ann Arbor, Mich. 48106.

To Formulate Relief Measures

Justice Seeking Access to IBM Business Secrets

By Connie Winkler
CW Staff

NEW YORK — The Justice Department is seeking broad access to IBM business secrets to formulate relief measures in the U.S. vs. IBM case here. This is the first step forward the government has taken since 1972 to determine how to actually break up the giant computer manufacturer if it is found to be a monopoly.

The government is now saying it doesn't have enough information to form relief strategies. Government discovery in the case stopped in 1972, while IBM's defense is presenting evidence that goes beyond 1972, according to the motion for relief.

Under the plan proposed to the court last week, the Justice Department's Antitrust Division wants a confidential task force set up to develop a relief plan. To come up with such a plan, the government said it needs to look at an extensive list of documents including IBM's current and seven-year operating plans, product phase reviews and internal organization and reorganization plans.

The government also wants to look at top management's ideas for satellite technology and satellite-based communications networks (including those of Satellite Business Systems), new computer systems and communications products, semiconductor logic and memory technologies and pricing plans. To put all these in perspective, the government is requesting thorough information on the present corporate organization, product lines, plant locations and numbers of employees.

Interesting Timing

The government, which is seeking the divestiture of IBM, is also asking for a relief hearing. It will be up to Judge David N. Edelstein to rule on both the presentation of the relief documents and on the hearing.

The "Motion for an Order Directing and Governing Production of Documents Preparatory to Consideration of Relief" was ironically presented to Edelstein on the 10th anniversary of the filing of the case, Jan. 17. The judge, however, did not file it until a week later.

The government may also ask for interim relief at the end of the trial, according to the motion. Interim relief could, for example, bar IBM from making any corporate organizational changes which could affect the ultimate relief, according to Robert J. Staal, head of the government trial team.

Moving ahead on the relief question, even while the trial is on, will expedite things, Staal maintained. A final ruling on the case is not expected until at least the mid-1980s.

Under antitrust law, relief can be imposed immediately after liability is found. Waiting until a final ruling is made in this case would be like letting a thief run free just because the trial is over and the appeal is pending, another source close to the case suggested.

IBM has until Feb. 16 to respond to the motion. The computer manufacturer has already told the government it will not provide its current and seven-year plans. IBM said the government already waived its opportunity to present evidence on relief.

IBM could not be reached for comment at press time. However, it is believed the company is concerned about the security of information it might give to the task force and fears it might wind up in the hands of competitors.

Staal said he recognizes IBM's concerns, but believes the 16-member task force is a reasonable size and carries the expertise necessary for the job.

The task force members were selected by Assistant Attorney General John H. Shenefield, who last summer convened an expert group to study the relief question.

The proposed task force members include Bruce B. Wilson, a former assistant attorney general and a member of the Antitrust Division in Philadelphia; John H. Chapman, of the government trial staff; Steven M. Woghin of the Justice Department's Antitrust Division; James H. Burrows, who heads computer sciences for the Air Force; and Sidney Fernbach, in charge of Lawrence Livermore Laboratory.

Other proposed members are Hendrik S. Huuthakker, Harvard Economist and government consultant, George E. Lindamood of the National Bureau of Standards; Charles P. Osborn and Richard Delamarter of McAdams Associates, and Alan K. McAdams, Cornell economist, who testified 78 days for the government.

The supervising officials will be Shenefield; Michael J. Egan, an associate attorney general, William E. Swope, director of operations for the Antitrust Division, and Joseph H. Widmar, who was on the trial staff when the government presented its case. Donald A. Resnikoff will be another official from the trial staff on the task force besides Staal and Chapman.

The government seeks to divide IBM into "several discrete, separate, independent and competitively balanced entities capable of competing successfully in domestic and international markets with one another and with other . . . competitors."

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Survey: Image Problems Plague Typical DPer

(Continued from Page 1)

On the whole, the participants appeared to represent an experienced but mobile group, DS&E found. For example, 51% spent 10 years or longer in the DP field, but only 30% stayed with their present employer throughout that time.

For 31%, the position they held was their first in DP; 23% worked for one other employer, and one-fifth held two previous jobs in DP. About 49% had spent five or fewer years with their current employer.

When asked to evaluate their current jobs, most survey participants felt they received adequate compensation as well as good advancement opportunities, according to DS&E.

Salaries for this group ranged from less than $12,000 to more than $30,000. About 84% of the total sample were at least moderately satisfied with current incomes.

Also, 60% of the participants expressed moderate to high satisfaction with current opportunities for advancement, although women expressed dissatisfaction with this aspect of their jubs more often than men.

Besides expressing positive altitudes toward current work experiences, most respondents showed a general enthosiasm for the DP field itself.

For example, 55% entered the profession because of an interest in computers. Seventy-nine percent found programming enjoyable and challenging, the survey found, and one individual proclaimed "a glassy-eyed enthrallment with computers."

Prior experience and education was the second most frequent reason women gave for choosing a DP career — cited by 18% of the female respondents and 12% of the men.

After "interest," men saw DP as an opportunity to get into a growing field with unlimited potential. This reason was stated by 19% of the men, compared with 14% of the women.

Salaries and benefits were equally important to men and women and represented 14% of the responses for both sexes. A few individuals "got into DP by accident."

Getting the Job

Turning from past to present, DS&E examined the whys and wherefores of seeking and selecting jobs in DP. The largest group of participants — about 30% — applied directly to the organization for their current position. Employment agencies emerged as the second most common means; they were used by 18%.

Some 17% found their jobs through employee referrals and 11% from recruitment ads.

Why this job? The majority, 39%, liked the compensation and benefits provided. The work itself lured 35%, particularly because of the professional challenges it offered. This reason was given by a larger number of women than men and by more people under 25 than any other age group.

Opportunities for advancement and personal growth led 26% to accept their present position; location influenced 25%, and 12% were persuaded by the image of the company as an employer plus its size and stability.

Reasons for Staying

While salary may have attracted most participants to their present position, they may be staying for other reasons. Sixty-six percent said the most satisfying aspect of their job was the work itself — its diversity, creativity, scope and professional challenge.

Only 17% cited a combination of compensation, advancement opportunity, training and job stability.

Following these elements, especially for those under age 25, was the opportunity to work with others, either coworkers or clients.

The Bad News

Now for the negatives. Management ineptitude, company policies and organizational bureaucracy topped the list of DP professionals' complaints. About 25% complained of management's inertia, indecision, ignorance of DP and about political conflicts in the organization.

The next largest segment of the sample, 23%, were dissatisfied by a number of career factors, including little or no opportunity for advancement, unsatisfactory salaries and lack of educational training.

Another 20% found their work ritualistic and boring, and 15% were unhappy with working conditions — specifically, physical layout, uncompensated overtime and "overwork."

However, a majority of respondents — a slim majority — believed management appreciated programmers' and analysts' work. Of these 53%, one-fifth said management included the DP department in its decision-making process, 15% noted the high investment in DP and 7% cited high salaries and benefits as evidence of management appreciation.

Most of the 34% who felt management did not appreciate their efforts complained of management's ignorance, neglect and budgetary constraints. Eleven percent were undecided. Complaints about management increased with age.

All but 6% of the respondents suggested ways to improve their jobs. Most wanted better working conditions including more space, privacy and modern furniture and equipment, but less noise. Of the 28% citing these factors, most were women, DS&E found.

Career Goals

When questioned about career goals, 54% of the sample said they aspire to management positions, either in DP or non DP-oriented jobs. The next largest segment, 15%, intend to stay in DP and advance along professional lines.

About 8% want to run their own business; 4% hope to do consulting work; 7% look forward to retirement; and 5% desire financial security.

If they had it to do over again, would these individuals still chose DP? More than three-fourths, or 76%, said yes.

"A Profile of the EDP Professional" will be available in March for $22.50 from DS&E, 49 E. 53rd St., New York, N.Y. 10022.

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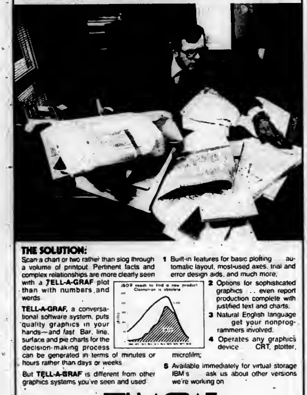

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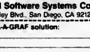

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Exxon Arm Unveils Lasers

(Continued from Page 1)

in the area of laser printers, where the lasers may be able to supplant more costly devices currently in use.

However, many of these applications are far down the road — expected in 1982 or beyond, except for fiber-optic communications, which could be implemented earlier.

But a "blue sky" application would be the use of such devices as parts of computer systems themselves. Exxon did not announce any products of this kind, but broadly hinted that the firm is exploring such uses for the devices.

The laser family itself offers devices that provide two standard wavelengths. The 835 nanometer infrared wavelength laser is compatible with most fiber-optic systems, the firm said, while the 800 nanometer unit should find application in long-distance communication and optical information processing technologies.

They are offered in three basic performance levels: devices which are electrooptically linear up to 8 milliwatts of electrical power, electrooptically linear up to 18 milliwatts of optical power and lasers which emit a pure fundamental mode beam at power levels as high as 18 milliwatts.

Flashlight Battery

The units can be modulated or turned on and off over one billion bits per second. According to Exxon, they can be powered by a flashlight battery or microcomputer power supply since they require only .2 watt of electrical power.

These devices are based on a theory that was postulated in 1917 by Albert Einstein, but which was not demonstrated until 1958 by Charles Townes, who received a Nobel Prize for showing a working laser. The word "laser" stands for "light amplification by the stimulated emission of radiation."

Post Office Joint Venture Suggested

Comments Show Fear of EMS Monopoly

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Postal Service's increasing involvement in electronic mail could eventually give the service a government-subsidized monopoly of the burgeoning electronic message services (EMS) industry, freezing out private companies which have already invested billions of dollars in EMS.

That contention and further charges that Postal Service electronic mail offerings are illegal and represent an unjustifiable expenditure of taxpayers' money were found in public comments filed earliet this month with the National Telecommunications and Information Administration (NTIA), the agency heading the study of post office involvement in electronic mail.

The Postal Service's Electronic Computer-Originated Mail (Ecom) service, now undergoing a 25-city trial implementation [CW, Dec. 4), is an "unjustified government encroachment which serves neither private nor public interest," according to comments filed by Citicorp. The company urged that Ecom be "deferred until such time as a related national policy has been determined."

Recurring Theme

Twenty-six of the responses to NTIA's request for public comments proposed that the Postal Service enter joint ventures with communications common carriers which already have electronic mail facilities. AT&T declared that "Congress should certainly assure that taxpayer funds are not used to duplicate capabilities which are offered in the private sector for the electronie movement of information."

According to figures supplied to NTIA by the Ad Hoc Committee for Competitive Telecommunications, "well over $100 billion is presently invested in telecommunications plants and equipment by private industry. The Postal Service would probably have to spend several billion dollars to equip itself to duplicate the services that already exist."

The post office's entry into what was described as a "healthy and vibrant" industry "would so chill the investment community as to preclude the entry into the market by any but the very largest and best financed corporations," according to the filing of Datapoint Corp.

Xerox Corp., agreeing with that point of view, said it has "serious reservations" about the Postal Service's ability "to function as a direct competitor without severely disrupting the marketplace." The company, whose proposed Xten communications service will offer an EMS capability [CW, Nov. 20], cited the Postal Service's "virtually unlimited access to federal subsidies."

In addition, Xerox said, Federal Communications Commision regulations have been developing in such a way as to encourage "an increasingly competitive, free enterprise marketplace for the provision of telecommunications services."

On the subject of government regulation, RCA Global Communications, Inc. said the Postal Service's entry into EMS "will create a danger of having so many diverse agencies of government involved in the telecommunications industry that U.S. communications policy would be extremely difficult to develop and implement. Further, significant regulatory problems would be created to ensure that no anticompetitive, cross-subsidization or misallocation of plant would occur."

RCA Globcom thus joined a number of other telecommunications companies which urged that postal EMS be "provided jointly to the public by the Postal Service and cummon carriers and that participation in such joint arrangements be made available tu all carriers on an equal footing. This would require very little investment on the part of the post office and would allow private companies to take advantage of the widespread post office system, the company noted.

"Electronic access to post offices should be open to all communications common carriers," the U.S. Telephone and Telegraph Corp. and ITT subsidiary, said in its filing.

Adapso: Stick to A-76

Comments filed by the Association of Data Processing Service Organizations (Adapso) called for the government decision-making process on Ecom to follow the policy direction outlined in the Office of Management and Budget (OMB) Circular A-76.

The circular, the National Association of Manufacturers told the NTIA,

(Continued on Page 10)

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Women Urged Not to Blame Others for Failure

By Jay Woodruff
CW Staff

CAMBRIDGE, Mass. — It is possible for a woman to spend so much time looking for others to blame for her lack of success that she does not take the time to take an honest look at herself, according to Ruth A. Knickman, data entry head of Federal Home Loan Mortgage Corp. of Arlington, Va.

Speaking here recently at a regional Data Entry Management Association (Dema) meeting, Knickman contended that data entry managers and supervisors, especially women, want the freedom to develop skills and responsibilities, but some "haven't fully learned how to deal with the freedom yet."

Only when women break through the barrier of traditional attitudes and socialization "can we determine why we feel the way we do toward working with men or women, why there is more conflict than harmony, why men are sometimes threatened by women and why women fear success," she added. To command the respect one deserves, one must be committed to "work hard, do a good job and fight for what you believe in."

Certain questions must be openly and honestly answered to determine one's potential to succeed, she said. "Do we really prefer the old submissive or dominant roles we were taught to play? Maybe we're very comfortable with that role and don't want to change," she suggested.

"Do we see ourselves as high achievers or are we content to stay just where we are because it's comfortable and safe? Maybe we feel the other guy is more qualified and, even if we tried, we wooldn't get it anyway."

Women can be negative, defensive and out for revenge instead of "being out for ourselves," she added.

People should approach their work not only to fulfill job requirements, but to increase experience and growth potential. Otherwise, a job may appear to be a dead end, Knickman said.

"If we looked more closely, we would find we are developing many skills that could later be put to good use in any field," she pointed out.

EMS Monopoly Feared

(Continued from Page 9)

clearly directs "that federal agencies will not generate a product or service that can be obtained from a private source unless such an activity has been justified in the national interest."

Adapso said such justified exceptions to the A-76 policy are not applicable in this area and strongly urged "good faith application of the principles and guidelines contained within OMB Circular A-76 to any policy consideration of [Postal Service] involvement in the electronic mail-industry."

Ability Doubted

Beyond the legal questions raised about Postal Service electronic mail offerings, several companies and associations expressed doubt about the Postal Service's ability to offer efficient and economical electronic message services. "Past history has shown that the service is unable to adjust adequately its services to meet the changing needs of the business community," the National Association of Manufacturers said. "We believe that past performance will only be repeated in the electronic communications area.

"The Postal Service is totally lacking in the capacity and technical capabilities to adequately service demands in this area."

In addition, the association said, "one of the requirements for electronic communications is the need for privacy and, again, past history has shown that the Postal Service is ill-suited to provide the privacy necessary to ensure the viability of the system."

In direct contradiction of that argument, however, the National Association of Postmasters of the U.S. (Napus) claimed that "privacy and security of the mail, equity, universality, reasonable and affordable rates can only be assured by a nationwide, federally regulated system such as that of the [Postal Service]."

Noting the existing nationwide system of post offices, Napus said "it is doubtful that many private electronic message transmission services would have the capital, resources or desire to invest in a network of electronic stations on the scale conceivable" by one Postal Service.

NTIA, heading the 10-agency investigation under the direction of Stuart E. Eizenstat, assistant to the President for domestic affairs and policy, hopes to have recommendations for President Carter by spring. Congress is expected to have begun considering post office involvement in electronic mail by that time.

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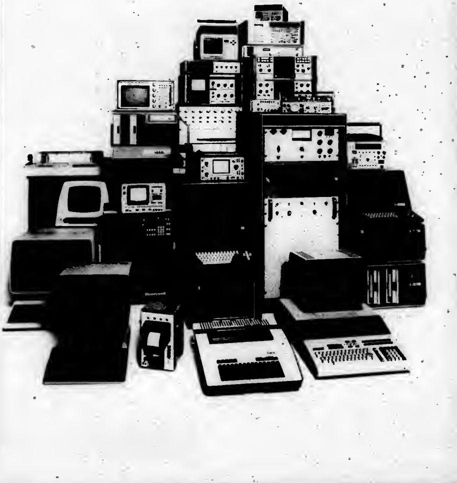

Employees' Checks Late, Incorrect

System Blamed for New York Payroll Mess

By Ann Dooley
CW Staff

NEW YORK — A large number of city employees are complaining about late or incorrect pay checks here, and the city's largest public employees' union is charging that a recently installed, $20 million computer system is partly to blame.

The complaints cover overtime, late pay and night differentials dating back months — and even years, according to Al Viani, research and negotiations director for District 37 of the American Federation of State, County and Municipal Employees. People have worked night shifts for three to four years without receiving extra pay, while others have been hired but not paid for up to nine months afterward, Vianti stated.

"Payroll has been in a terrible mess for as long as I can remember," Viani said. Although the city said the new system would alleviate these problems, it hasn't come close, he stated.

David Woodbridge, director of the Financial Information Service Agency (Fisa), the department that administers the automated system, contends the system is performing just as it should. Woodbridge blames the payment delays on the agencies that submit inaccurate or incomplete payroll records to the central computer.

Meanwhile, an estimated 900 complaints have been made to New York's Labor Relations Office by city workers, "far beyond anything we've ever had before," according to Anthony Russo, director of that office.

All the controversy surrounds the Integrated Financial Management System (IFMS), which was installed July 1, 1977 to help control city finances [CW, Sept. 19, 1977]. The system was never intended to alter individual agency procedures, but rather to integrate various functions such as budget and payroll, according to Woodbridge.

Although the centralized system was suggested several years earlier than 1977 to help the city recover from its 1975 fiscal crisis, it was not implemented at that time. State and federal laws enacted in connection with the city's financial rescue stalled implementation.

After only 18 months of design and development, the system was installed and began integrating the city's budget and accounting functions. It has been successful in those applications, officials noted.

Several months ago, the city centralized its massive, error-ridden payroll system; that's when complaints about the system's performance began to mount.

The traditional agency payroll system requires clerks to compile agency payroll data, sometimes by hand. Complex calculations such as overtime and work differential are performed manually, and the new system is — at times — merely printing the workers' check.

"It's basically an 1890 system," Viani remarked. "Why have computers if they can't do the computations?"

While Viani admitted many of the problems are attributable to the different recordkeeping practices in different city agencies, he does not see this as an impossible barrier to creating an efficient payroll system.

'Bad Management' Tactics

The problems spring from "bad management" tactics, Viani said. City officials "show an ignorance or arrogance in terms of employees." These problems could be solved if anyone really cared, he continued.

Fisa itself has no real control since it has to answer to the Comptroller's Office, the Office of Management and Budget and the Finance Administration, according to Viani. "No one is in charge," he stated.

The answer is in a Department of Operations study which revealed the payroll problems could be alleviated if city agencies were directly linked to the central system, Viani said. To develop and implement the plan, the study indicated, would take 18 months and cost $3 million.

The damage being done to employees' morale, let alone their personal incomes, warrants this change, Viani maintained. Even though a solution has been found, nothing is being done about it, he charged.

Woodbridge did not deny severe problems are associated with the payroll system, but they cannot be attributed to the IFMS, he said. Data submitted by some city agencies is still faulty, and it is unrealistic to think

(Continued on Page 16)

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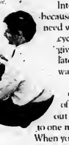

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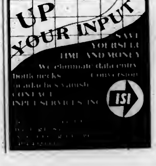

FAA Not Expanding DP at Centers, Airports

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — No larger capacity computers or new computer backup systems are planned for any major U.S. airports or Air Route Traffic Control Centers (ARTCC) until at least 1986, according to a spokesman for the Federal Aviation Administration (FAA), despite indications within the aviation industry that there is a serious need for them.

Besides the Automated Radar Terminal Systems (Arts II) currently being installed in more than 70 small and medium-sized airports around the country (see related story), the only new systems planned are computerized units to handle flight data for offshore centers like San Juan, Puerto Rico; Anchorage, Alaska; and Honolulu, Hawaii, due possibly in 1981, the spokesman indicated.

While the FAA agrees that such additional equipment would increase the air safety factor by "enabling air traffic controllers to do their jobs much more easily," time-consuming red tape and financial considerations are the main stumbling blocks to FAA action in this area, he said.

"We have to go by the requirements dictated to us by our Air Traffic Service in considering or buying new hardware," the spokesman noted. Air Traffic Service determines what equipment is needed, and the FAA procures on that basis, he explained.

Depending on the complexity of the program or system requested, an agency review can take anywhere from six months to two years. Outside interest groups must be considered, too, and they can greatly prolong the process, he added.

Furthermore, competition among vendors of comparable computer systems causes problems for the FAA because "we try to maintain commonality throughout the agency," the spokesman said. "If we do go to another manufacturer, we then have to train the technicians on a different set of equipment and buy spares for a different set of equipment."

Aware of Advantages

Despite the time and money problems that delay the FAA's acquisition of equipment, the agency is well aware of the advantages it would offer. Besides the safety factor, bigger and better computer equipment allows an increase in the traffic that airports can handle, offers bookkeeping advantages, allows critical data recording and helps in the "better and quicker" training of air traffic controllers, the spokesman said.

"We're definitely looking intu several situations in the country right now," he noted, including the one at Chicago's O'Hare International Airport, which has experienced a number of air traffic problems because of its computer [CW, March 20, Nov. 6], and at the San Diego Airport, where a mid-air collision claimed 144 lives last September.

Sixty-three air traffic controllers at O'Hare, members of the Professional Air Traffic Controllers Organizations (Patco), demanded a parallel computer backup unit for their radar control system in a lawsuit filed in 1975 against the FAA, the Civil Service Commission and the Department of Labor.

Since the filing of the suit, O'Hare has experienced at least one massive air traffic slowdown resulting from computer problems at O'Hare and the ARTCC that serves it, located 30 miles away in Aurora, Ill. The trial took place in January 1978 and a decision is still pending.

Dangers of Overfeeding

A similar slowdown occurred at the Houston, Texas, Regional ARTCC just befote the Thanksgiving holiday, when its IBM 9020E computer "choked" from being fed too much flight plan data; it had not been programmed to automatically restrict its input.

As the computer reached its infurmation storage limit, it slowed down and dropped some functions which then had to be performed manually by the air traffic controllers. The problem resulted in two-hour flight delays in Houston and other Gulf Coast cities.

The Houston Regional ARTCC uses the digitized National Air Space Radar Control System, and O'Hare employs the Arts III system. Both indicate an airplane's airline name, number, speed and altitude.

In the event of a computer failure in either system, identifying information as well as speed and altitude information on the displays is lost and the controllers must make an immediate transition to a mental three-dimensional picture to control the airplanes. This results in accurate but less efficient control.

Although FAA officials have always insisted no real danger to air passengers comes from such a situation, a spokesman for the O'Hare air traffic controllers voiced a different opinion last spring.

"The possibility of two airplanes hitting or of having a mid-air collision increases in the first few minutes after the computer fails, when the controller could become disoriented and lose track of his airplanes," Richard Scholz explained.

Some Smaller Airports Getting Arts II Systems

WASHINGTON, D.C. — More than 70 airports in the cuuntry have installed or will soon install computerized radar terminal systems to enhance flight safety in busy terminal areas, according to the Federal Aviation Administration (FAA).

Designated Arts II, the system is a slightly less sophisticated and lower capacity Automated Radar Terminal System than the Arts III systems now in operation at the nation's 63 busiest airports.

Built around a Computer Automation, Inc. LSI-20 minicomputer with 32K words of memory, the Arts II, like the Arts III, works in conjunction with existing airport surveillance radar and an electronic transpunder in each airplane, an spokesman explained.

The sweep of the radar triggers a transponder reply. This signal is then fed into the Arts II computer, where a data tag is generated for presentation on the radarscope next to the appropriate target. Included in the tag is vital flight information identifying the aircraft, its altitude and whether the aircraft is climbing or descending, the FAA spokesman said.

Air traffic controllers in facilities not equipped with Arts must presently obtain this information by radio or other means and either remember it or write it down.

Developed by Burroughs

Arts II was developed by Burroughs Corp. under FAA contract for use at radar-equipped airports with medium traffic levels. First operational a month ago at the Toledo, Ohio, airport, Arts II is running smoothly there, according to its supervisor of air traffic controllers.

The FAA spokesman stressed that the installation of the Arts II radar systems is not a reaction to the recent mid-air collision over San Diego. "It's all been in the works for a long time," he said. "We just can't come up with an Arts II system overnight."

Those airports where Arts II has been delivered and is undergoing installation or pre-operational testing are at Lubbock, Texas; Edwards AFB, Pensacola and West Palm Beach, Fla.; Fort Wayne, Ind.; Anchorage and Fairbanks, Alaska; Spokane, Wash.; Knoxville, Tenn.; Montgomery, Ala.; Otis AFB, Falmouth, Mass.; Griffis AFB, Rome, N.Y.; and Macon, Ga.

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Researchers Devise Method of Measuring Grief

By Marguerite Zientara
CW Staff

HOUSTON — Three psychologists at the University of Texas Medical School here have used computer analyses to refine a scientific conclusion that emotional mourners do themselves more good than those who react stoically to the death of an intimate.

Recent studies have shown that those who react calmly to such deaths suffer more medical problems, severe depressions and restless feelings — and are more prone to die earlier — than those whu vent their grief. Apparently, the stoic mourners cannot get the grief out of their systems and as a result, they suffer.

Those findings and their own clinical observations prumpted the trio of doctors to begin measuring levels of grief through responses to questionnaires. The computer offered an easy way to analyze many items relating to large numbers of people, according to group member Thomas R. Faschingbauer, assistant professor of psychiatry.

"We hope that ultimately the questionnaires will be useful for primary physicians and others to determine whether a physical illness is related to unresolved grief," he said.

Inventory Undertaken

In an effort to develop a "rapid, thorough and essential kind of interview . . . that provides a way to test and score grief reactions," Faschingbauer said, in 1977 the trio analyzed by computer 260 59-item questionnaires, concerning bereaved persons' behavior.

From the original questionnaire, the psychologists derived a 26-question version that they sent to 400 peers, friends and personnel at the university's medical school, Hermann Hospital and several other medical centers.

The results of the questionnaire, called the Texas Revised Inventory of Grief (Trig), are currently being analyzed by computer to establish "normal" grief indicators with which any deviations can be compared.

"Past studies have assumed that all object losses are the same, without trying to measure them in any way," Faschingbaeur noted. Such studies typically have not even asked the subjects if they were grieving, but have simply looked at people whose spouses had died. The studies have sometimes included every categury from the death uf a luved one to a child going off to school, he added.

Stages of Grief

"Nu one really knows huw long normal grief should last — somewhere between six and 12 munths is probably the average — but we do know a lot about the distinct stages of grief, and when people have not gone through those stages we can see trouble," according to group member, Dr. Richard DeVaul, associate professor of psychiatry.

The stages are shock, acute mourning and resolution, he nuted In the shock period, the bereaved expresses disbelief and denial.

The second stage involves acknowledgment of the death, crying spells, possibly guilt or shame, depression, insomnia, social withdrawal and, in some cases, symptoms of the deceased's illness. The third phase includes acceptance of the loss, awareness uf having grieved and return to general well-being.

"We have to watch for clues that something went wrung during the second period especially," DeVaul said. The Trig questionnaires are designed as a quick and easy means of letting physicians pick up signs that their patients did not reach the third stage.

Until Trig was initiated, studying grief had been "a very sloppy area of research," according to Faschingbauer. "But now that we're able to measure some of these things, we can use computers to an extent not previously possible."

Although Trig is a refinement of the group's earlier study, there is room for further refinement, Faschingbauer noted. "We did an orthogonal [statistically independent] rotation in our factor analysis, trying to minimize the relatedness among the factors. We wanted to get factors as independent as possible so we could get sets of items that measured one thing and not another," he explained.

However, since the group actually believes that the bereaved's past behavior is very much related to his present feeling, according to Faschingbauer, "we shuuld have done an oblique rotation that would not have set the factors independent, but would have allowed them to emerge with the true relatedness among them expressed, as it occurs in nature."

The group plans to make such a rotation in the future and will possibly change the questionnaire on that basis.

The gruup has also applied for financial support so the grief evaluations can be expanded tu include such subjects as those close to a comatose patient or those mourning a divorce.

"Then we'll put them all together and find out if the same kind of grief is occurring and how we can get some kind uf total 'grief score,'" Faschingbauer said, adding that once able to ascertain the type and intensity of a patient's grief, a physician should be able to better treat him, either physically or psychulugically.

"I've always used computers in my work," Faschingbauer nuted, "since I often deal with multivariate analyses of one type or another.

Using the Statistical Programs fur the Social Sciences package from SPSS, Inc. and the school's Control Data Corp. Cyber 171-2 computer with 198K bytes of memory, the department has spent about $200 in the past two years on computer time.

The researchers have also used the school's 1,200 line/min CDC 580 printer.

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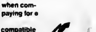

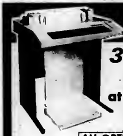

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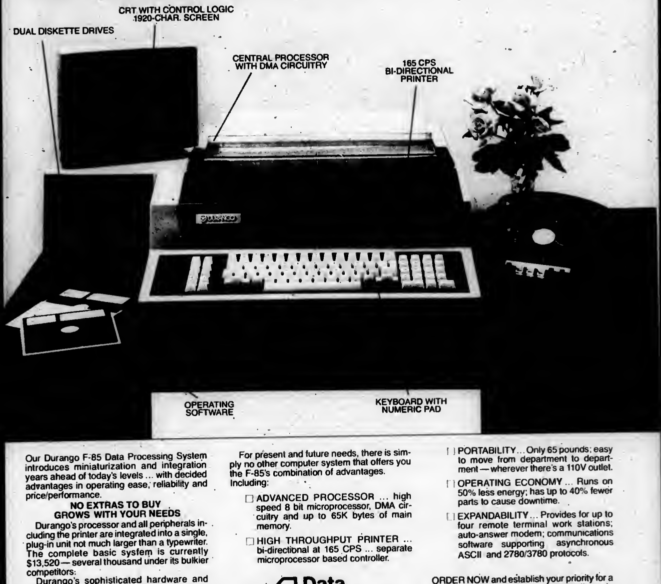

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Chin Pleads Guilty In Grade-Changing Scheme

JAMAICA, N.Y. — A former Queens College student who was indicted last month on charges of falsifying 154 computerized grade records [CW, Jan. 8] has pleaded guilty to the charge of receiving a reward for official misconduct.

James Chin, 35, awaits sentencing on Feb. 20, according to a spokeswoman for the office of Queens District Attorney John J. Santucci.

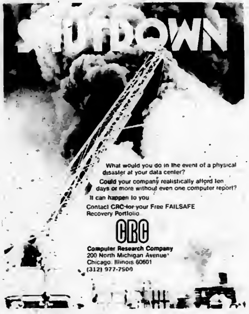
A hearing for Tom Tang, 26, who was indicted on one count of falsifying business records, will be held today. He may enter a plea or begin the trial process.

Tang, according to the district attorney's office, allegedly did the actual grade changing, while Chin allegedly provided interested parties for the scheme.

The original indictments charged Chin with receiving approximately $300 from one student for allegedly falsifying 22 grades and $100 from another for falsifying 11 grades.

Chin could receive a sentence of up to seven years in jail. Tang could get a four-year sentence.

Both Chin and Tang pleaded not guilty at their arraignment on the day the indictments were announced in December.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Honeywell Donates Mini

WORCESTER, Mass. — Honeywell, Inc. has donated a Level 6 minicomputer worth more than $70,000 to Worcester Polytechnic Institute (WPI) here. The mini will be used by both graduate and undergraduate students majoring in either electrical engineering or computer sciences.

Sy Kraut, vice-president of Honeywell's Minicomputer and Terminals Operation (M&TO) headquartered in Billerica, Mass., described the gift as tangible evidence of the company's support for WPI and for M&TO's engineering program currently in operation at the college.

Under the program, several new college graduates are selected each year to work for Honeywell while at the same time obtaining a company-financed master's degree. The three-year schedule consists of six-month rotating work assignments, as well as two or three graduate courses per semester at WPI.

The college was selected by Honeywell following an intensive evaluation process that considered WPI's interest, facilities, staff and ability to meet the overall program requirements.

The Level 6 mini, a Model 43, was accepted on behalf of the college by WPI's president, Dr. Edmund T. Cranch. Honeywell management in attendance, in addition to Sy Kraut, included Ross A. Belson, director of hardware engineering, and Don Smith of design automation.

Award Nominations Open

PRINCETON, N.J. — The Rockefeller Public Service Awards programs is now accepting nominations for recipients of five $10,000 awards to be given in 1979.

The annual awards honor individuals whose outstanding achievements in public service have contributed "creative and constructive ways to the solution of important problems facing the nation."

Nominees may be working in the public or private sector and at the local, state or national level.

Nominees must be U.S. citizens and may not be seeking or holding elective office or be sitting judges. The deadline for receipt of nominations is May 15.

A brochure describing the awards and nominating procedures can be obtained from Ingrid W. Reed, Administrative Director, Rockefeller Public Service Awards, Woodrow Wilson School, Princeton University, Princeton, N.J. 08540.

Payroll in Confused State

(Continued from Page 11)

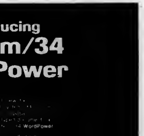
IFMS will make this disappear.

The city payroll system has historically been rife with errors, Woodbridge stated, and correcting this problem is no simple task.

What has been accomplished is something of which to be proud, Woodbridge said. The system is actually quite phenomenal considering the short time allowed for installation and implementation, he asserted.

IFMS runs in batch mode. This spring, it will be upgraded to an IBM 370/168-3 and a 3032, each with 6M bytes. In May, an IBM 3033 with 8M bytes will replace one of the other systems, Woodbridge said.

The system includes a large number of Genesis One Computer Corp. G77 CRTs located in city agencies that are used to retrieve data, but not alter or input any data. At the central site, data is entered on 35 IBM 3277 terminals. The programming is done in Cobol and the system operates under IMS.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Cerebral Palsied Students Now Communicate

By Marcy Rosenberg
CW Staff

EDISON, N.J. — At a cerebral palsy (CP) center here, individuals who cannot talk, write or even use a conventional typewriter are learning to communicate through a microcomputer-based keyboard system designed for users who lack fine motor control.

By merely pressing several buttons, students at the United Cerebral Palsy Association of Middlesex County can load various word and phrase storage files and then call out the data to compose their own messages.

Because the keyboard contains recessed, well-separated buttons, students with poor arm and hand control can operate it with a head pointer.

The Computer-Assisted Communication System (Cacs) evolved from a series of experiments begun in 1974 by Bell Laboratories and its social service organization, Telephone Pioneers of America, to determine whether the physically handicapped could benefit from a computer-based communications tool.

Early designs tested at the CP center were so successful that Bell continued to upgrade the system and installed the current Cacs configuration there in June 1978.

Cacs is implemented on a Digital Equipment Corp. LSI-11 microcomputer that uses two Pertec Computer Corp. single-sided floppy disk drives to store five million bits of information. The LSI-11 interfaces with Bell's specially designed keyboard, an Ann Arbor Terminals, Inc. K2480D CRT and a Decwriter LA30 line printer. A serial interface and a video generator connect the keyboard to the microcomputer.

The micro runs on Bell's LSI Unix (LSX) operating system that allows many programs developed under standard Unix to be used without modification, the firm said.

Three Control Keystrokes

Cacs software is set up so students can store, retrieve, display and edit text information with a maximum of three control keystrokes, according to Travis Tallman, director of speech and hearing at the CP center.

Users can perform these control functions at increasingly complex linguistic levels because the program provides file management for words, phrases and sentences. Such files include a scratch pad, where students can construct and temporarily store words by direct key input, a "modifiable phrase book," for constructing phrases, sentences or sentence carriers; a message file; a file for frequently used words; and a file containing "word-ending abbreviations."

The latter two files allow users to save keystrokes by retrieving common words, phrases and word endings with one- or two-letter codes — for example, "u" for "you" and "g" for "...ing"

Freedom of Expression

Besides displaying messages on the screen, students can also produce hard copy on the line printer. As a result, teachers and therapists don't have to be present for students to communicate ideas.

Traditional therapy techniques require the presence of a human receiver for feedback. Using one such technique, students express themselves by pointing to words, letters or phrases on a portable language board. If a student cannot spell, his available vocabulary is necessarily limited by the board's size. Since Cacs provides the visual feedback to let cerebral palsied children and adults work and communicate independently, it encourages freedom of expression and individual interpretation, Tallman said.

Many students have gone beyond basic communication. "Vocabularies are much more extensive than we imagined," she noted. "Individuals are using words like "orangutan" and "chimpanzee" and "some started writing stories, legislative bills, essays and letters to friends."

Cacs was first implemented at the CP center in 1975 as a special keyboard terminal with a TV display that was linked on a time-sharing basis to Bell's DEC PDP-11 minicomputer in Murray Hill, N.J.

Having the stand-alone microcomputer version on-site allows use by up to three students simultaneously and provides more storage capacity. However, since the center does not have the correct temperature environment for the systems, "breakdowns occur and we have to wait for Bell to come and make repairs," Tallman noted. "We're just now getting into the maintenance of the Cacs ourselves."

Future Cacs upgrades are in the offing. Bell Pioneers will provide double-sided floppy disks in March to increase system storage capacity from five million to 20 million bits.

Further down the road, researchers are examining the possibility of employing graphics display terminals to help users who cannot recognize words to communicate via literal and conceptual pictographic symbols.

Bell Pioneers donated Cacs to the CP center and will share design information with medical and volunteer organizations. The Unix system can be licensed through Western Electric Co.

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And for that good look, the INTERVIEW II Stand-Alone Monitor helps identify problems in both hardware and software. It displays full or half duplex data, on-line, without disturbing your network. The INTERVIEW II not only finds trouble quickly but helps spot trends and potential problems before the system fails.

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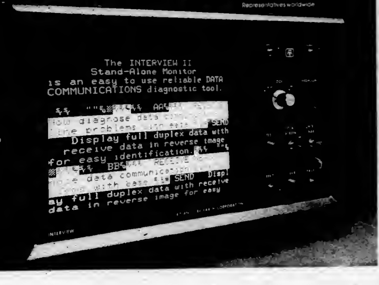

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for easy identification.

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data in reverse image for easy

Managers on the Move

GORDON J. GENEK has been elected vice-president of United Jersey Banks' Data Processing Division in Hackensack, N.J.

Genek served as director of operations at United Jersey Banks' Hackensack DP center from 1973 to 1977. He was most recently associated with McGraw-Hill in Hightstown, N.J.

A graduate of the City College of New York, Genek earned his master's degree from the New York University Graduate School of Business Administration.

•••

ANTHONY DeGREGORIO has been appointed manager of data processing for U.S. Tobacco Co. in Greenwich, Conn.

DeGregorio joined U.S. Tobacco in 1964 after several years at *Parents* magazine. Prior to this promotion, he was programming manager.

DeGregorio attended Hunter College and various management courses sponsored by the National Association of Tobacco Distributors and IBM in New York and at Cornell University.

•••

JOHN WEISSMAN has been appointed director of the graduate computer science curriculum at West Coast University in Los Angeles.

Weissman has been an instructor in the graduate computer science program since 1975. His new responsibilities include curriculum development and faculty selection at the West Coast University centers in Los Angeles, Orange and San Diego.

Genek

DeGregorio

•••

JOSEPH W. MAGER has been named director of systems and data processing at National Revenue Corp. in Columbus, Ohio.

Mager was formerly associated with Gates, McDonald & Co., a subsidiary of Nationwide Insurance Co., as manager of systems and programming and as a DP consultant.

Mager has studied at San Diego Mesa College, Franklin University and Ohio State University.

•••

RICHARD PAULSEN has been named director of management information systems for the Sunbeam Appliance Co. in Chicago.

Prior to this appointment, Paulsen was the manager of systems development activities for the Sunbeam Corp. Systems Development Group. Before coming to Sunbeam, he served as manager of systems support for Bell & Howell Corp.

Paulsen has a B.S. degree in mathematics from Western Illinois University and an MBA from Loyola University.

•••

JOAN M. KOHLHORST has been named a vice-president in the Operations Division of Chemical Bank in New York City.

Before joining Chemical Bank as an assistant vice-president in 1977, Kohlhorst was senior director of operations at ADP, Inc. Prior to that she was with Citibank.

She holds a B.S. degree from Seton Hall University.

•••

WILLIAM G. PECK has been named director of development at Genesee Computer Center, Inc. in Rochester, N.Y.

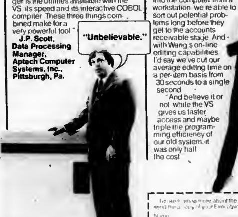
Peck joined Genesee in 1969 as a specialist in optics and has been manager of applications products since 1974.

He holds a B.A. in mathematics and an M.S. in statistics from the University of Rochester

•••

JOHN CAREY BROWN has been named administrative officer for the Kansas Bureau of Investigation (KBI) in Topeka, Ks.

Brown has been with the KBI for five years and was most recently the supervisor of the Information Services Section.



EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer—the Burroughs B1700—with card input sequential files and no video displays, we suffered long delays and storage constraints

"Now with our Wang VS system, storage is virtually unlimited and we simply recall a screen load of information on the CRT to make a change in seconds—all of this without interrupting our normal flow of work

"We've put everything in our business onto our VS system including payroll accounting sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15 with 61 programs written, debugged and tested—all by only two people—and not a single line of code had been written until the machine came in the door

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it. Thanks to the programming power of the VS, I actually came up with more

"Before we converted to the VS the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second

"And believe it or not while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason:

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience

One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851

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System Protects British Policemen on Patrol

Special to CW

KEMPSTON, England — *Responding to a report of suspicious persons spotted near an abandoned warehouse, a police officer leaves his patrol car to investigate. Suddenly he is surprised by burglars, who disarm him.*

While the officer stalls for time, a CPU at police headquarters notes that his car has been left unattended for an unusually long time and pinpoints the exact locations of other officers near the vehicle. They are alerted immediately and arrive on the scene in the nick of time to rescue the policeman and apprehend his assailants.

Trying to make this capability commonplace, the Bedfordshire Police Department is osing twin minicomputers and 13 CRTs in a pilot program based at the department's Kempston headquarters.

Dubbed "Command and Control," the system is intended to monitor how long an officer takes to arrive at a particular destination and when he should report off-duty. If too much time elapses in either case, the system signals a warning.

The system also allows an officer at one terminal to contact an officer at any other without going through headquarters. To ensure that police stations have instant commonications with each other, a priority system permits a terminal user to break into another user's transmission in an emergency.

In addition, Command and Control enables administrative personnel to generate and collate rapidly the mass of daily police department reports.

The twin Honeywell, Inc. 6/43 minicomputers feature a moltiline commonications processor to control 13 teleprinter terminals, a transaction processing software package and an intersystem link that reportedly simplifies communications between one mini and the other. The processors are sopported by Honeywell's Gcos/6 operating system.

Calendar

Feb. 19-22, Denver — **Seminar on Data Communication & Teleprocessing Systems**, sponsored by International Computer Negotiations, Inc. (ICN). Contact: ICN, 1331 Palmetto Ave., Winter Park, Fla. 32789. Also being held Feb. 26-March 1, Cherry Hill, N.J.

Feb. 26-27, Washington, D.C. — **Third Annual Conference on Preparing Government Procurement Solicitations**, sponsored by the American Institute of Aeronautics and Astronautics (AIAA) and the Technical Marketing Society of America (TMSA). Contact: AIAA Conferences, P.O. Box 91295, Los Angeles, Calif. 90009.

Call for Papers

IEEE POWER ENGINEERING SOCIETY 1979 SUMMER MEETING Vancouver, B.C. Canada July 15-20

Papers submitted should be within the Power Engineering Society's scope of interest. Authors should immediately request an author's kit from IEEE headquarters, Technical Conference Services Office, 345 E. 47th St., New York, N.Y. 10017.

Original manuscripts should be submitted as soon as possible to IEEE headquarters.

1979 URBAN AND REGIONAL INFORMATION SYSTEMS ASSOCIATION (URISA) CONFERENCE, San Diego, Calif. Aug. 19-24

Potential topics include geoprocessing, data base administration, urban planning, transportation, land use, natural resources, mini/microcomputer applications, economic development, social indicators, remote sensing, fiscal and budgetary systems, citizen information and criminal justice systems.

Two copies each of an abstract and a draft (or detailed outline) of the proposed paper should be submitted as soon as possible to Lee R. Johnston, Urisa Conference Program Chairman, 823 Monticello Drive, Escondido, Calif. 92025.

NATIONAL MICROGRAPHICS ASSOCIATION INTERTECH '79 San Antonio, Texas, Nov. 6-9

Suggested topics are related/interfacing technologies — word processing, computer/data processing, optical character recognition, facsimile, laser technologies and videodisk/videotape mass storage, new applications — both micrographics and related technologies, and the current and future state of the art of micrographics and related technologies.

Abstracts should be at least 250 word long, typed and double-spaced.

Authors should submit abstracts or outlines before Feb. 28 to Al E. Eggert, Program Review Committee, National Micrographics Association, 8728 Colesville Road, Silver Springs, Md. 20910.

ASSOCIATION FOR COMPUTING MACHINERY 1979 ANNUAL CONFERENCE Detroit, Mich., Oct. 29-31

Papers are invited on any aspect of computer science and applications, but those directly related to the theme — "Advances of the '70s, Challenges of the '80s" — are of particular interest.

Papers should not exceed 15 pages including abstract, text, references and bibliography. Session proposals are also welcome for panels or special activities. Proposals should indicate a topic, type of activity and suggested participants.

Five copies of all papers and/or session proposals should be submitted by March 1 to James L. Elshoff, Computer Science Department, General Motors Research Laboratories, Warren, Mich. 48090.

FIFTH INTERNATIONAL CONFERENCE ON VERY LARGE DATA BASES Rio de Janeiro, Brazil Oct. 3-5

Tutorial papers, papers dealing with applications in developing nations and papers dealing with minicomputer and microcomputer data base systems are especially sought.

Other topics of special interest include data base design, data base software engineering, distributed data base, data base machines, data semantics and modeling, implementation considerations, user interfaces and data base applications.

In addition to regular papers (5,000 words), two-page extended abstracts of papers on the applications of data base technology in developing nations will also be accepted. These abstracts will be presented in special sessions.

The deadline for papers and abstracts is March 5. Camera-ready copy is due by June 11.

Authors should send papers and abstracts to Prof. Howard L. Morgan, The Wharton School, University of Pennsylvania, Philadelphia, Pa. 19174.

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- Monitor data base integrity and trace data base activity
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- Display the contents of system queues (SYSIN, SYSOUT), system messages, etc.
- Execute remote diagnostic programs
- And much more

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Editorial

Crying Wolf?

In the process of outlining its defense in the antitrust suit filed against it by the Justice Department, AT&T seems to have rewritten telecommunications history to suit its own purposes.

Bell claimed the FCC has consistently ruled in favor of competition, making it more difficult for the telephone company to maintain its obligations under regulation [CW, Jan. 22]. Yet all the major decisions which AT&T unsuccessfully challenged before the commission were later dragged through the courts by Bell in vain attempts to substantiate its claims.

A total documentation of the record since the Carterfone decision is a job for a legion of historians. Even AT&T with its virtually unlimited staff of attorneys and researchers, would be hard-pressed to piece together all the delays, regulatory roadblocks and legal court appeals it initiated to slow the progress of competition.

Bell now claims that the specialized carriers did not get interconnection facilities because they were inexperienced and incompetent. The fact remains that the FCC provided every avenue for Bell to prove its claims that the new carriers would hurt Bell System revenues.

The desire to give AT&T every opportunity to respond plus the inherent delays in the commission's procedures served to hurt the new carriers. Time was on Bell's side, as was graphically proven when the Data Transmission Co (Dotran) went out of business.

The irony was that years later, the commission finally agreed that Bell had played a major role in Datran's demise because of its anticompetitive responses. By then, of course, it was too late.

AT&T lawyers pointed out that the phone company set up its General Trades operation to provide non-Bell suppliers with the opportunity to provide equipment to the operating companies. But the lip service which General Trades gave to this effort and the frustration experienced by independent equipment suppliers brings bitter memories to many vendors.

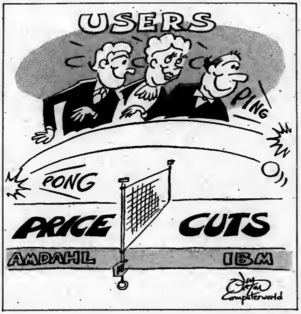
While this situation has gradually improved, that has happened after the independent companies began supplying their equipment to the independent phone companies. If the non-Bell equipment posed such a threat to the integrity of the Bell System, why did the same equipment built to the same basic specifications not wreak havoc with the facilities of the independent phone companies?

And on the subject of potential harm to the telephone network, Bell filed claim after claim that the interconnection of non-Bell equipment would affect the integrity of the phone system. These claims were never proved. The only result of this effort was the now defunct series of Data Access Arrangements, which did little more than cost users money and discourage more rapid installation of non-Bell equipment.

In each and every case, AT&T backed down only when it had exhausted all regulatory and legal remedies. The costs of all these challenges was astronomical, and the amount of business lost by both Bell and its competitors is impossible to calculate.

The record of the past years will make it difficult for AT&T to portray itself as the victim of regulatory dictates and scheming competitors. The inroads made by all those competing with Bell System companies have had a negligible effect on the business vitality of AT&T operations and its revenues.

Bell is doing itself little good by claiming it has been victimized by events over which it had a little control and few defenses.



Letters to the Editor

'Tis A Serious Error

Herbert Grosch's Jan. 15 column contained a serious error that should not go uncorrected. He claimed that Charles Wilson, at his confirmation hearings, stated "What's good for General Motors is good for country."

This is not in fact the case. An examination of the *Congressional Record* will show that Wilson said, "What is good for America is good for General Motors and vice versa for that matter." A considerably different statement, you will note.

It is assuredly a matter of considerable import for a columnist such as Grosch to be at least minimally accurate in the articles for which he is responsible.

Peter Schaeffer

Chicago, Ill.

Want to Be a Martyr?

In rebuttal to Karen Bartucce's letter in the Jan. 8 issue: Few, if any, women joining the new Association for Women in Computing will drop any of their other professional memberships. Women face unique problems in the DP industry:

- How do you keep current in the fast-paced technology while you take off six years to have a family?
- How do you compete with the corporate politics of the "Old Boy Network"?
- How do you progress without the male mentor relationships that your co-workers enjoy?
- How do you make full utilization of our new employment rights without reinventing the wheel?
- When you get to an executive level, how will you find some qualified women for your staff, and how will you assess their loyalty, if you are to provide equal opportunity in your organization?
- How can you help fight for equal retirement rights in your company?

The women who have now spent 20 or more years in this industry wasted a lot of energy trying to be better than their male counterparts in order to gain marginal acceptance in programming. Few of them were considered for management jobs until all the men who started with them were already in management.

Ms. Bartucca, if you want to be a martyr and go it alone when we could help each other, we'll suffer from your lack of support. But we'll survive, and in some enterprises you might not.

Frances Smith Abernathy

Rockville, Md.

Credit Where It's Due

I would like to correct your article entitled "Stop & Shop Now Offering EFT Service" [CW, Jan. 8]. This is not the first supermarket banking in the Northeast.

The people in the Buffalo-Western New York area have been enjoying the convenience of supermarket banking for more than two years. We now have several banks offering the electronic funds transfer (EFT) service in many different supermarket chains as well as department and drug stores.

I cannot even venture to guess how many EFT stations there are, but I do know the number has steadily grown since the first one was installed in a Super Duper supermarket. Most of these EFT stations are available 15 hours a day, six days a week.

So let's give credit where credit is due: Western New York.

Robert L. Santoci Jr.

Buffalo, N.Y.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Jan. 30, 1974

DETROIT — Burroughs Corp. announced a car-pooling program free to any organization that wished to use it to help combat the energy crisis. Written in ANS Cobol and running on 20K bytes of memory, the coding was described as easily modifiable for use on any kind of computer with a compiler based on the published Cobol standard.

— — —

TULSA, Okla. — Judge A. Sherman Christensen, hearing the Telex vs. IBM antitrust suit here, modified an order that had prevented IBM from using a census of the DP industry compiled for Judge Philip Neville during the Control Data Corp. vs. IBM suit. Christensen's revision empowered each court in which IBM faced legal action to decide whether to admit the census as evidence and to establish its own protective order for the use of the material.

Eight Years Ago
Feb. 3, 1971

WASHINGTON, D.C. — The Federal Communications Commission removed the last roadblock preventing Microwave Communications, Inc. (MCI) from offering data services to users between Chicago and St. Louis. The FCC approved 11 microwave stations that MCI planned to use to provide point-to-point service to computer and other data users.

Reader Commentary

DP Team Comes to Aid of Stricken Friend

Special to CW

In what they believe is a medical first, an impromptu team of DP specialists has come to the aid of a friend — the victim of a stroke — with some unusual applications of DP technology.

Joseph Kirby of Irvington, N.Y., suffered a severe stroke in April that left him completely unable to move or make any sound. The victim's family appealed to its DP friends: "Can you find a way to use your expertise to allow Joe to communicate with us?"

Joe's doctors endorsed the appeal, knowing that the ability to communicate might very well be the motivating factor in Joe's fight for life. The doctors assumed their patient could see and hear, but had no way of confirming it or even of guessing the degree to which Kirby had retained any of those faculties.

Ray of Hope

"I knew Joe had an iron will," one of the friends, Jacob Sternberg, said. "I knew he was determined not to become a vegetable, but he needed a ray of hope to start fighting."

That was the start of what Sternberg, president of New York-based Conversational Systems Corp., and his colleagues came to call "Project Kirby."

During a visit to Kirby's hospital room, Sternberg had noticed Joe could move one eyelid. It was the only motion Joe could force his body to produce — the only hope of showing that inside the inert body was a man struggling to let his family and friends know his thoughts and feelings.

The breakthrough had come. Sternberg, along with Austin Boldridge and David Geschwind, senior technical staff members of Conversational Systems, began work.

Boldridge invented a fiber-optic sensor that could detect a blink and placed it next to Kirby's eye. They added a microprocessor to the unit designed rapidly by people who knew that the sooner it was assembled, the sooner they could communicate with their friend.

"Don't ask where the parts came from," said Sternberg. "We swiped what we needed wherever we found it."

Geschwind connected the microprocessor to a Hewlett-Packard Co. 2645 intelligent terminal that displayed the letters of the alphabet and had a cursor Joe could move by blinking his eye.

Now there was no question. Joseph Kirby was not only able to control a small part of his body — just one eyelid — but he was also able to see. Within half an hour he grasped what was happening and painstakingly spelled out his name a letter at a time.

Next came a further refining of the system. Geschwind programmed some simple functions that Joe could select by blinking. Joe soon learned how to erase a letter, then a line and, as he became more familiar with his personal communications system, he began speeding up the cursor in his eagerness to "speak" or slowing it down when he needed time to stop and think.

'Icing on the Cake'

Through an informal buddy network, Sternberg next laid hands on a voice response unit "borrowed" from one of the largest banks in the country. The team described it as "icing on the cake." Now Joe was not only able to see the letter he picked, but was able to reenforce the selection by hearing the name of the letter as he called it up.

By autumn, doctors told the DPers Joe was making a remarkable recovery. "They can't explain it, but who cares?" Sternberg reported.

The members of Project Kirby are continuing their work and developing new features for their system in hopes that what they are doing will point the way for other researchers working with stroke victims.

The system is being expanded. Joe is slowly recovering the use of his fingers and toes. The next phase is to provide him with a way of handling words and, later on, sentences leading to even more interactive communications.

Joe, the team members say, is not the only one who could benefit from the instrumentation put together in Project Kirby. They feel that any patient who can move a thumb, a toe or any part of the body can be provided with the ability to communicate. As they express it, "One blink per letter beats Morse Code."

Project Kirby gives such patients a way to learn to handle entire blocks of data and to send such messages as, "Call the doctor," "That hurts" and even "I love you."

In one small experiment, a point has been proven by a courageous man and a determined group of his friends. Data communications is a lot more than machines talking to each other. In the final analysis, it's communication between people.

The Taylor Report

Advice to NCR User: Find Contract's Meaning

By Alan Taylor
Special to CW

An NCR Corp. spokesman confirmed the information presented in last week's Taylor Report that his company knowingly omitted definitions from its Universal Agreement and that while such definitions might be found in other NCR documents, no list of terms and documents is given to users or prospective clients.

NCR challenged this column's attention to the Universal Agreement on two grounds. First, it said, the focus should be on industrywide contracts, not just NCR's contract. Second, it had not heard that the Universal Agreement was causing difficulties for users or attorneys.

I agree with NCR's first point; an industrywide focus is a good idea. And I plan to do something about it.

Dissatisfied User

However, I disagree on the second point. A letter, which I received just hours after hearing the claim that neither NCR users nor attorneys are having problems with the contract, proves otherwise.

Steven Notson, DP director for Shawnee County, Kan., wrote to me asking for help. The DP department, he explained, has an NCR Criterion 8550 system it is trying to run in a multiprogramming mode under the B-3 operating system.

"Since we have also had problems concerning the Universal Agreement, I have been following your articles in *Computerworld* very closely," he said. "We feel we have totally lost almost all resemblance of support from NCR. Our equipment is not functioning adequately to meet our needs, and we cannot seem to bring up or try any new equipment or techniques without massive problems.

"In an overall sense, we are totally disillusioned with NCR's service and equipment. However, NCR claimed it has us bound to a five-year contract and that there is no way out.

"What I need is information pertaining to the Universal Agreement, exactly what I must do to break it and how binding it actually is," Notson stated.

Arbitrate Meaning

In response, I must say that trying to break the Universal Agreement is the wrong course of action. The first step should be to find out what the agreement is. This will reveal whether the county has signed a legal death warrant or an agreement that gives user protection.

(Continued on Page 24)

The Human Connection

Citizen-Held DP Power Can Topple Bureaucracy

By Jack Stone
Special to CW

At least one person of authority strongly feels that computer technology in the hands of the citizenry is a formidable weapon for breaking down government bureaucracies.

The Jan. 6 issue of the San Francisco *Chronicle* featured a thoughtful editorial essay written by Norman Macrae, deputy editor for the London *Economist*, entitled "Data Processing and Bureaucracy." It was the second of a three-part series. Macrae explained why he believes voting democracy has broken down and how it will be rebuilt in great measure by the "DP revolution, which is going to turn bureaucracy into a competitive cottage industry."

A student of contemporary American civilization, Macrae cited an American government study that estimated the largest single class of employees in the U.S. today have jobs dealing, in the broadest sense, with information processing and communications. This class comprises about half the working population and has about twice as many people as the agriculture and manufacturing industries combined.

Macrae assessed the impact of modern, computer-based information systems in terms of employee performance. He claimed "the potential productivity of workers in this largest industry is about to grow by several hundred percent because of an information revolution far bigger than the industrial revolution after James Watt discovered the steam engine.

"Anybody who believes that after this information revolution a voter-employed bureaucracy can continue to be the main instrument of government is being as daft as anybody who forecast in 1816 that the number of handloom weavers would continue to grow."

Predicts Shrinking Costs

Macrae recognized the long-term impact of low-cost, easy access to large data bases. He stated that "the nature of the computer's information revolution is the exact opposite of the steam engine's industrial revolution. The steam engine made start-up costs for the individual entrepreneur larger and larger.

"But the data banks of tomorrow are going to places into which every part-time enthusiast can telecommute [sic]. In all jobs connected wtih the use of information, start-up costs for the individual entrepreneur are going

(Continued on Page 24)

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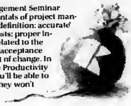

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Micros for Business: A Very Affordable Idea

By Garret A. Rowley
Special to CW

Some small business paople *should* consider buying microcomputer systems. I disagree with Charles Dunning's views as reported in "Micros Seen Not Yet Ready for Business" [CW, Dec. 4].

He gave readers the impression that no small businessperson should look at a microcomputer system that costs less than $15,000. He also seamed to have little faith that software developers could provide totally customized software for small business purposes.

What was omitted in this presentation was that area of small businesses in which little need for a complote business system exists. This is the business that has no apraciable inventory, yet still needs an affordable computer to reduce paperwork.

When the need for data storage is eliminated, much of the paripheral hardware is unnacessary. And a truly low-priced computer systom becomes a reality.

Since March 1978 I have been associated with Jefferson-Otis & Co. as its computer consultant. This life insurance firm offers insurance consulting and financial planning and is a leader in the area of advanced underwriting tachniques.

After a series of planning sessions which clearly exposed the need for a computer system, a Radio Shack TRS-80 Level I unit with 16K bytes of random-access memory (RAM) and a printer was purchased. We then began softwere design; I had to orient my work to the firm's marketing methods.

By mid-summer, Mark Jefferson and Rol Otis concluded that thay were satisfied with the computer hardwara and even happier with the software. The hours of pencil and paper calculations that had been eliminated convinced them their computer system had already paid for itself.

Reader Commentary

Last August, the decision was made to market our softwara to other insurance firms. As time passed, we realized we wera fortunate in choosing the TRS-80 hardware since it has a national reputation and is available practically anywhere in the country.

This way, our marketing base has not been limited to our locality, and we did not have to expose anyone to a lesser known microcomputer. Including Jefferson-Otis & Co., we now have more than 30 users (at six sites) of our various programs. We expect this number to grow in 1979.

Varied Programs

Programs aro quite varied and generally interrelated. One program conducts a basic client interview and actually converses with the client.

Another program determines a family's income objectives and producos a combination term/ordinary policy to meet those objectives. With still another one, a client can see how to fund extra insurance coverage using dividends and cash values from existing policies instead of money out of his own pocket.

There is a program that assists the businessperson with financial management. Financial data is stored on cassettes, and the program produces monthly statements including business expenses, income vs. expenses, use of cash surplus and household expenses.

Subordinate programs in the package perform less sophisticated functions such as annuity, investment and withdrawal calculations (future and present values) and premium, amortization and depreciation calculations.

Our programs are not limited to the insurance industry. Attorneys, bankers and financial consultants can utilize our estate planning software. Certain estates will incur, at the death of one or both spouses, a sizable federal tax liability.

Few people realize they can minimize or eliminate these taxes by setting up trusts and transferring ownership. In learning how to program these concepts, I had to go through the calculations manually

(Continuad on Poge 23)

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Letters to the Editor

Different Owner

I followed with interest the series of In Depth articles on the "New Software Economics" by Werner L. Frank.

Indeed, what better way to measure successful software products than by numbers? Scert is listed as one of the $20 million cumulative revenue products.

Scert is alive and well and vital, now exceeding the $30 million in cumulative revenues. However, it is owned by Performance Systems, Inc., not Comten. My company purchased Scert from Comten over a year ago.

Richard E. Andersen
Technical Manager
Performance Systems, Inc.
Rockville, Md.

An Attack of Jargonitis

How could you do it? The lead article in the Dec. 11 issue of *Computerworld* is headed "Edwin Newman Gives DP Jargon Passing Grade." The Dec. 25-Jan. 1 issue has an excellent editorial cartoon that criticizes the use of the word "prioritize."

But what do you sneak in between? In the Dec. 18 issue, on Page 31, the headline and text refer to "packetizing."

Edwin Newman should reconsider. Perhaps we are up to our "ize" in jargon.

T.S. Taylor
Waterloo, Ont.

Wrong Reasons

Attorneys at the U.S. vs. IBM antitrust trial asked Jane Cahill Pfeiffer some tough questions ["Pfeiffer's Uniqueness at IBM Disturbing," CW, Dec. 25-Jan. 1]. Naturally, Pfeiffer was not about to bite the hand that feeds her.

Besides, it is natural that her ego makes her believe she made it on merit; therefore, others don't make it because of a lack of merit.

IBM was not known as an enlightened employer in the late 1940s, when the company discharged all married System Service girls, supposedly to make room for returning war veterans. In fact, ambitious women did not apply to IBM for jobs because of this policy. That is probably part of the reason why IBM does not have long-term professional women in responsible positions.

Rating individual professionals and managers without profit and loss responsibility has always been a subjective business. It is easy to justify a particular individual's success or failure according to one's point of view.

What is difficult to believe, however, is that IBM has no women of vice-presidential caliber in its employ. If that is true, IBM must be recruiting women for the wrong reasons.

Jean J. Bartik
Minneapolis, Minn.

Stupid and Wrong

After reading the antiaffirmative action letter from Sandi Doss [CW, Dec. 25-Jan. 1], I am angered, but not surprised, that a woman would write such a letter.

Although some women — and a few minority people — have made it to the top, the norm is that they are held back by their own acculturation and by institutionalized racism and sexism.

I know of a young woman secretary who asked to be transferred to the key entry department at the firm where she works. After attaining proficiency in the entry of records, she became interested in the computer equipment. She read a manual and was able to fool around with the machine in off-hours.

When the only Datapoint Corp. programmer left the firm, she asked to help with program maintenance, and her supervisor sent her to a short Datapoint course. A new key entry person was hired, and the ex-secretary was the person responsible for keeping the software running.

Sounds good, right? The problem was her supervisor couldn't get her paid entry-level programmer wages.

The primary reasons given by management were:

- We trained her, so she owes it to the firm to work at a low salary.
- She started as a secretary three years ago at $575 a month; a jump to entry-level programmers' wages would be too much.
- She came to us as a secretary; really, how good a programmer could she be?

I've seen numerous instances in university environments when a male director was replaced by a female assistant director in all but title and salary.

By keeping women out of positions in which they can utilize their individual talents, we all lose what they might contribute. By holding back blacks, Puerto Ricans, Chicanos and native Americans, we are saying white men have all the answers.

This is stupid, wrong and a terrible loss.

White men (and women who have "made it") have much to gain from sharing the troubles, worries and rewards of power with their colleagues. I think only corporate management really gains from keeping us separated, thereby getting away with lower pay for minorities and women.

Henry Noble
Seattle, Wash.

Business Units Affordable

(Continued from Page 22)

and found that a typical estate planning case could take up to a week to do on paper.

The computerized version speedily performs all the repetitive calculating functions and presents organized results. Estate planning on the micro now averages less than half an hour.

The microcomputer can also become a training device. For a new agent, advanced underwriting concepts can be hard to grasp. Confusion arises from performing the necessary calculations with pencil and paper.

The micro avoids that problem and has been successfully used to accelerate the learning of trainees.

Our software library now totals 20 programs. They can be individually purchased, but it has been our practice to offer them in packages of eight for a total package price of $1,000.

So there is a microcomputer business system with high utility value available for less than $2,600 (the hardware cost for the Level-2, 16K bytes of RAM and the printer is $1,587).

Rowley is a computer consultant with Jefferson-Otis & Co. in Omaha, Neb.

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The data entry people. IESI

User Should Find Out Contract Meaning

(Continued from Page 21)

I like one point about the Universal Agreement's arbitration stipulation. It can be used to clarify the contract's meaning. Traditionally, courts do not handle this aspect; they focus on the dispute itself, when one side has already claimed that the other side owes it something.

Arbitrating the meaning of parts of the agreement is a necessary, economical first step. That is what Shawnee County should do now, rather than try to break the agreement.

The arbitrator can decide only between two suggested versions of the agreement, so there is no point in asking him to rewrite it. Shewnee should develop some alternatives which, I presume, would let it out of the five-year agreement if NCR support is not satisfactory and if the equipment does not function adequately.

The letter signed by W.F. Walsh, NCR's vice-president of financial systems marketing, is important [CW, Jun. 22]. A carbon copy was sent to — and the letter may well have been drafted by — NCR's associate general counsel, Ben E. Olive.

Customer Protection

CW readers may recall Olive's statements in a letter to the editor [CW, Oct. 30]. "In actual fact, NCR's customers have a great deal more protection regarding software than most users," he stated. In addition, NCR customers have the "guaranteed" ability to resell equipment, he said. And he thought the Universal Agreement is very clear.

An arbitrator should be shown how the Universal Agreement is presented by NCR employees, that it contains deliberately undefined terms and that definitions of the terms are not listed anywhere. Then he might decide to exercise his right under the agreement to review Shawnee County's intent when it accepted the agreement.

The terms of the contract, he may conclude, should be interpreted so as to give full protection to the county for complaints about hardware, software and service.

While NCR and Shawnee are arbitrating the meaning of the agreement — providing safeguards for future user protection — it is likely that NCR will try to put matters technically straight. It is possible that, in fact, the agreement really permits Shawnee to either effectively insist on its rights or to withdraw from the contract.

But before talking about breaking the agreement, Shawnee should find out what the agreement means.

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Technology Can Topple Bureaucracy

(Continued from Page 21)

to grow smaller and smaller."

Macrae was sensitive to the software stumbling blocks which have been one major factor inhibiting mass demand for information services. "The big advance will come when a solution is found to the main search procedure problem," he noted. "A solution will emerge through developments arising from computer-aided learning systems.

"Once this breakthrough occurs and search procedures are competitively supplied, it will be realized that the revolution in the creation of information is quite different from the creation of automobiles."

Macrae developed the intriguing notion that the potential availability of information to the public will represent a competition for the control of government in the democratic system. This idea seems rational if one accepts a relationship between bureaucratic control and the [selfish] possession of operating information.

"It is silly to suppose this revolution in the information industry can leave unentrepreneurialized [sic] the biggest and least efficient part of the huge information industry, namely the civil service [the public sector]," Macrae stated.

Disney World Like Utopia

Macrae used Disney World as a perfect example of how the proper use of computer technology can improve local government. "The same monitoring by computer that constantly checks that the roller coaster is not about to develop metal fatigue also checks utilities, transport, sewerage and trash. The result is an extraordinary absence of both litter and crime.

"The productivity of local government operations is several hundred percent higher in private sector Disney World than in the public sector. The reason is that Disney [World] is a customer-oriented, market-dependent entrepreneurial job with output targets. By contrast, in the public sector, local government is a producer-oriented, nonmarket-checked, bureaucratic job.

"If Mickey Mouse were everywhere elected mayor on a performance contract," Macrae postulated, "then local government efficiency would everywhere be multiplied several times."

Letters should be addressed to Stone at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

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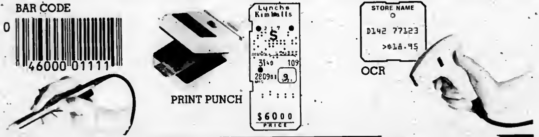

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Package Apportions Payment

Multicompany User Eases Billing Chore

By Don Leavitt
CW Staff

SANTA CRUZ, Calif. — Sometimes a user has to work with a software developer to get what he wants. But in the end, the effort becomes a product others can use, too.

Santa Cruz Answering Service is a complex of three companies that provides more than 70 products and services including rental services, retail sales, capital goods leasing and radiotelephone services and repairs.

The business is dynamic, and general manager Sam Bishop wanted to do well by his 1,000 or so customers, giving them not only the goods and services they wanted but a simple approach to billing as well.

For a long time, Bishop had been utilizing a service bureau to handle his DP needs. By mid-1977, however, he realized that approach wasn't right for him. Even with the best of service "we couldn't provide timely information for ourselves or for our customers," he recalled.

Errors, late billing, continual clerical adjustments and unreliable aged receivables reports plus "very high labor costs" finally led him to seek help. He contacted Hank Ebertshaeuser, a consultant who runs Success Systems, a custom software house in nearby Watsonville.

Bishop wanted a billing system that would provide each customer with a single statement each month, even if the goods and services used came from different companies within the Answering Service complex. He wanted his clients to be able to make a single payment that could be apportioned properly once it was received.

Ebertshaeuser thought he could not build the system for Bishop on a microprocessor. Work got under way on that basis, but he finally realized he couldn't do it as easily in that environment as he could on a Burroughs Corp. B80 system. Bishup concurred with the change, and a contract was signed with Burroughs in February 1978.

The software the consultant put together includes all the application logic Bishop wanted and a spectrum of system support features as well, including access methods (based on Burroughs' indexing scheme), data compressiun and internal sorting capability.

The B80 system includes a CRT and the software — now available from Success as the FILMGR package — was designed to pre-

(Continued on Page 26)

APL Gains CALL Support

SMYRNA, Ga. — Subroutines written in Fortran, Cobol or other programming languages can be invoked from an APL program through use of a package recently developed by Interprocess Systems, Inc.

Call/AP is an IBM Assembly language auxiliary processor program that uses standard APL shared variable communications facilities, a spokesman explained. Input parameters for a subroutine are accepted from APL by Call/AP and placed in a form expected by the subroutine.

Once the subroutine work is complete, Call/AP sends the results back to the APL user. Standard subroutine calling linkages for Cobol, Fortran and assembler have been tested and many of the programs can be executed from Call/AP without change, the spokesman continued.

Call/AP allows the use of existing non-APL routines that perform certain functions more efficiently than would be possible if they were executed through APL's interpretive code. APL osers should find the prospect of being able to use well established Fortran statistical and engineering programs and various data base interfaces "especially attractive," the spokesman commented.

The uses of Call/AP can be diverse, he added, claiming one user is currently using the auxiliary processor to issue job status requests from APL to IBM's JES2 subsystem, while another is using it to link APL users and the Adabas data base management system from Software AG.

Call/AP is available now for installations with APLSV and for VSAPL under Virtual Storage Personal Computing (VSPC). The package costs $7,500 for unlimited use on a single CPU, the vendor said from Suite 112, 1260 Winchester Parkway in Smyrna, Ga. 30080.

DOS Job Accounting Updated

NEW YORK — Jasper, the job accounting system developed and marketed by Datachron Corp. since 1972, has been taken over by computer Associates, Inc. and renamed CA-Jasper+.

The package is a job accounting, performance evaluation and user billing system. The VS version captures paging statistics and utilizes the Power/VS spooler accounting records to measure reader, printer and punch activity and provide turnaround and queue time statistits, a spokesman noted.

CA-Jasper+ includes a comprehensive report generator called Wizard that accesses the Jasper account files and enables users to define their own daily and summary reports. Wizard has full computational, selection and reporting facilities, the spokesman said.

CA-Jasper+ processes CICS accounting information generated by IBM's Perfurmance Analyzer II facility as part of the basic system, he added.

The package is said to provide the user with a full range of utilization statistics, updating its own account files with information not captured by Power/VS.

CA-Jasper+ incorporates a full costing system covering both daily and historical data. Thruugh interaction with embedded algorithms, the user has a complete Batch/CICS billing detail and summary charging and cost allocation facility, the company said.

Along with marketing rights tu the package, Computer Associates also acquired the services of several people who had been key to Datachron's development and support of Jasper over the past seven years. Although an OS version is under development, the package currently will support only DOS and DOS/VS sites.

CA-Jasper+ costs $6,000 from Computer Associates at 655 Madison Ave., New York, N.Y. 10021.

Pascal Progresses

COSTA MESA, Calif. — Technical Committee X3J9, charged with developing a standard for the Pascal language for the American National Standards Institute (Ansi), will hold its second meeting Feb. 20-22 here at the South Coast Plaza Hotel.

The initial meeting in December attracted 70 potential members, according to Justin Walker of the National Bureau of Standards (NBS). Others interested in the project are still welcome, he said, noting that X3J9 will be working with the International Standards Organization as well as Ansi.

Further information about the project is available from Walker at Room A-367, Technology Building, NBS, Washington, D.C. 20234.

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'Control/IMS' Updated

SUNNYVALE, Calif. — Response time reporting (RTR) is the most significant enhancement built into Release 1.9 of the Control/IMS transaction accounting and reporting performance system from Boole & Babbage, Inc., according to a spokeswoman.

The basic system is used in the data communications environment of IMS to provide evaluation, planning and forecasting support and financial management control information. Control/IMS accumulates data that is not collected by the standard IMS log or monitor functions, she said.

RTR allows the user to report separate response time component timings such as input queue, elapsed processing time and output queue duration. The distribution of these timings is shown in ranges by both individual and cumulative percentage, the spokeswoman added.

RTR also accounts for special cases such as message switching which, she noted, do not always make a response to the originating terminal.

The capabilities provided by RTR allow the user to determine which transactions or classes of transactions are meeting their response objectives.

Control/IMS Release 1.9 costs $17,000 from the vendor at 510 Oakmead Parkway, Sunnyvale, Calif. 94086.

NCR Data Pathing Systems Gain Data Base Software

DAYTON, Ohio — Software providing data base support to manufacturing firms utilizing NCR Corp.'s Data Pathing source data systems will soon be available from NCR. The Relational Data Management (RDM) package and a subset called Basic Data Management (BDM) provide capabilities at the front-end processor level formerly associated with large host CPUs, according to a spokesman.

The relational data feature of RDM incorporates partially inverted files which allow definition of multiple levels of indexes. Direct access to data is provided by a relative byte address within the indexes, the spokesman explained.

Multiple key retrieval enables efficient inquiry response and simplifies application programming, he claimed.

Flexible Data Structures

The flexibility of RDM data structures reduces duplication of records, ensuring that all management and production areas base their decisions on the same current data. Multitask processing and parallel servicing of all disk drives provide efficient response to queries and update requirements, the spokesman said.

When used with Data Pathing System 150 series processors, the software can reside on a Model 154 disk processor. As many as four 150s can share the data on a 154 while communicating with a host CPU, the spokesman said, adding that the 154 disk subsystem can store 240M bytes of data.

The two data base systems will be available in the second quarter. RDM will cost $15,000 or $500/mo, while BDM will cost $3,000 or $100/mo, NCR noted.

Package Handles Billing Chores

(Continued from Page 25)

vent the casual user from doing anything wrong.

Apportionment Process

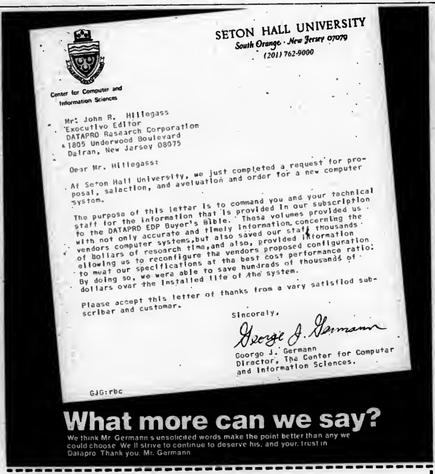
The cash accounting and apportionment facility is clearly the part Bishop likes best. In a multicompany receivables situation, this accounting can be very difficult, requiring minute control over the money entered. The on-line apportioning procedure eliminated many hours of spread-sheet tabulation and provided a direct link into the cash journal entry in one step, the manager explained.

The last step in the apportionment process is a system-prepared duplicate-copy bank deposit slip with deposit amounts specified by company. Thus the entire system is self-contained, carrying all the detail work to its logical end point.

A report of revenue by product or service, by company, is prepared within the billing run and requires no special setup or effort by the system operator. "It is simplicity itself," according to Bishop.

Easy Operation

The system went live last July, and the user is still very pleased with what he has. Bishop said the software is "for the business person who wishes to concentrate on his business. We have no programmer on-site and haven't had a 'down' of any kind in months."



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Center for Computer and Information Sciences

Mr. John R. Hillegass
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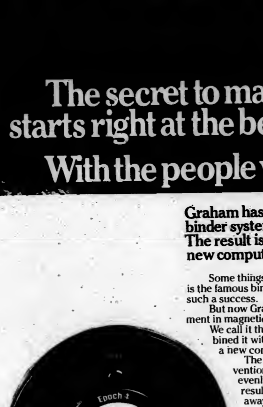

Graham has combined Epoch 4's famous binder system with a new magnetic particle. The result is a more durable and reliable new computer tape–Epoch 480.

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Monitoring of CICS Enhanced

McLEAN, Va. — Version 2 of the CICS/VS Utilization Monitor and Chargeback System from Johnson Systems, Inc. has been enhanced with the addition of graphics, extended measurements and debugging aids, according to a spokesman.

The Resource Utilization Graphs (RUG) include a set of 26 predefined histograms and facilities from which users can extract other histograms to show data not provided in the standard set. In addition to graphically showing use by program, CPU time, paging rate or file I/O — and a variety of other measures — the RUGs provide actual numerical data for each measure, he said.

The extended measurements supported by the enhanced package include paging data, true internal response time and both real and elapsed CPU time, the spokesman said.

The debugging aids include a transaction dump utility that provides detailed reports by transaction type, record or response time. User data attached to selected records can be printed out as well.

A Task Control Area (TCA) trace utility stores multiple copies of the TCA along with the Transaction Work Area (TWA) if the user has specified it. The net benefit is that the user can track back to determine what happened and when without having to examine full memory dumps, the spokesman noted.

The system continues to provide chargeback facilities that allow the user to account and bill equitably for all resources used by each user and application. The package is tailored to either DOS/VS or OS/VS, but within each of those environments it is release-independent.

The DOS/VS version costs $3,000 if interfaced with Johnson's Jars accounting package and $3,500 if intended for stand-alone use. The comparable OS/VS costs are $4,000 and $4,500.

Johnson Systems is at 7923 Jones Branch Drive, McLean, Va. 22102.

UCS Plugs in Cray-1

KANSAS CITY, Mo. — United Computing Systems, Inc. (UCS) has become the first remote computing services firm to offer its clients access to a Cray-1 computer system.

Developed by Cray Research, Inc., the Cray-1 has until now been purchased and employed solely by government agencies and government-related groups for scientific applications [CW, Sept. 18]. Installed last September, the mainframe is up and running, according to UCS.

"Our installation will dispel the myth that the Cray-1 is strictly a system for scientific applications. We expect applications for our system will run the gamut from government to multinational organizations," UCS President G.J. Lorenz observed.

Mail Lists Maintained

VAN NUYS, Calif. — Super-Mailer is a comprehensive system for maintaining mailing and subscription lists and for producing labels, upper/lower case personalized letters and statistical analyses, according to the vendor, Occidental Computer Systems, Inc.

The software functions on any IBM 360 or 370 running under DOS. It can accept additions or changes to files on card or tape and can handle addresses with as many as four lines of information, a spokesman said.

A restart capability allows long print jobs to be segmented to fit available machine time or to protect against machine failure.

Super-Mailer is written in DOS assembler for efficiency, the spokesman said. The package, including source code, sample JCL, test data and documentation, costs $960 from Occidental at 6666 Valjean Ave., Van Nuys, Calif. 91406.

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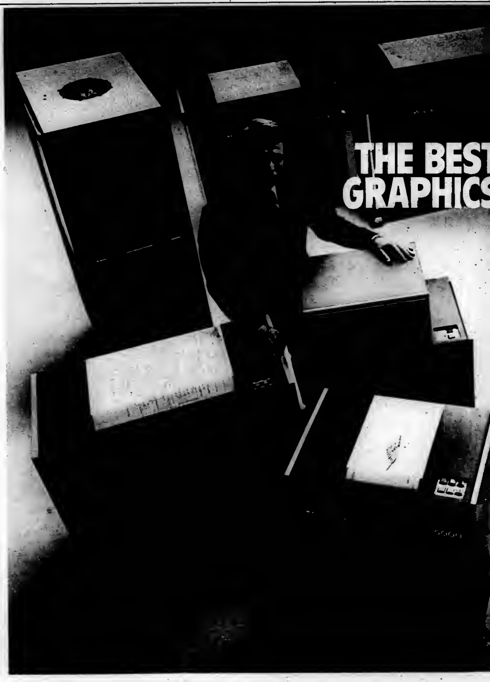


Finance Control Goes On-Line

DALLAS — An extension of University Computing Co.'s Financial Control System (UCC/FCS) enables users of the system to run on-line operations — data entry, file maintenance and inquiry — against the FCS financial data base.

UCC/FCS On-Line uses the capabilities of IBM's CICS and can be included in new purchases of the application logic or used with existing DOS/VS or OS/VS installations of FCS, a spokesman said.

Dollar, budget and maintenance transactions to UCC/FCS can be entered through the on-line extension. Inquiry support can trace transactions entered or determine account balances in the data base, he continued.

On-line data entry is subject to the same edit and validation criteria applied to the batch system, and security under FCS On-Line includes the password and selective file access functions of CICS plus other levels of security tailored to the application, the spokesman said.

The on-line extension costs $7,500 (DOS) or $10,000 (OS) from UCC at 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

Package Tracks Users; Bills for S/34 Time

SALT LAKE CITY, Utah — The System/34 Real-Time Accounting System from Management Consulting Services (MCS) allows management to measure usage and therefore apply costs directly to each application processed on an IBM System/34, according to a spokesman.

More particularly, the package is capable of tracking total sign-on time by user at any terminal, measured in wall-clock time. It can also distribute CPU usage by user or, optionally, by user by job.

Time is allocated as a percent of total computer time available to each job in execution, the spokesman explained.

With Release 4 of IBM's system control program for the System/34, the MCS software will also measure printer time by each user or, optionally, by user by job, measured in wall-clock time, he continued.

Reports generated by the package are in sequence by department by user, the spokesman said, adding that reports can either detail each job run or simply show the total time used by each user.

In addition to reports of time used, the accounting system also applies rates to those times to provide expense reports. In either form, the reports show monthly and year-to-date information by user or by general ledger account.

The program costs $400, the spokesman noted from Suite 10, 220 E. 3900 South, Salt Lake City, Utah 84107.

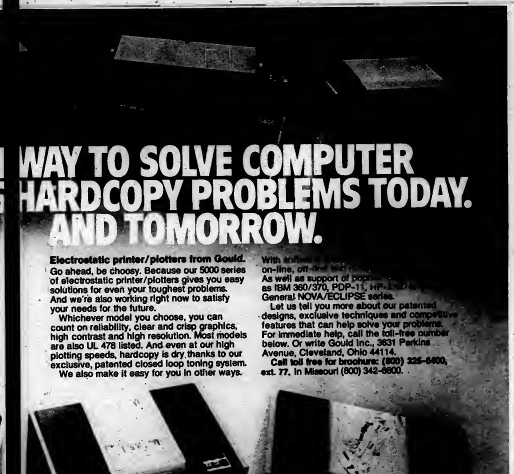
NIS Offers Remote Aid

CUPERTINO, Calif. — A range of remote computing services along with tailored software all based on the Digital Equipment Corp. Decsystem-2020 are now being offered by National Information Systems, Inc. (NIS).

System support includes both DPL, a conversational data base management system, and Maxbasic, which NIS claimed is the most advanced Basic available for the large DEC systems.

An accounting package incorporates accounts payable, accounts receivable, general ledger, payroll and personnel.

More information is available from NIS, Suite 2345, 20370 Town Center Lane, Cupertino, Calif. 95014.



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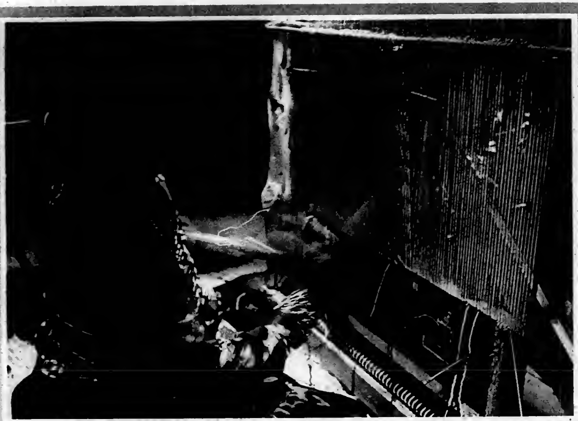

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At Consortium in Iowa

DBMS Puts College Users On-Line to Data

By Dr. John J. Jackobs
Special to CW

CMC Colleges Associated is an educational consortium formed to operate a computer system for three colleges in the Cedar Rapids-Mt. Vernon, Iowa, area: Coe College, Cornell College and Mount Mercy College, all private four-year liberal arts colleges.

A Digital Equipment Corp. PDP-11/70 minicomputer was purchased and installed last June. The system was put together by Quodata Corp., of Hartford, Conn.

The software with the system includes the RSTS/E operating system, Basic-Plus and Fortran from DEC; QDMS, the data base management system (DBMS) from Quodata; and SPSS for the PDP-11 from Carleton College.

The computer staff is small and is comprised of a technical director, who coordinates implementation of administrative systems on the computer, and the computer center directors from the three colleges, who primarily coordinate matters of academic concern. With the small staff and the need to bring up administrative systems quickly, a data management package was required.

User Responsibility

QDMS follows the center's philosophy of bringing the computer to the users through on-line capabilities. This allows each user to maintain and use his data whenever and however he requires. The user becomes totally responsible for the integrity of the data.

Through the report generation features, extensive custom programming, which seriously delays the time between report request and report generation, is eliminated.

In the six months of operation, we have implemented and turned over to the admissions offices at each college an on-line prospective student system. At Mt. Mercy, we have implemented a skeleton alumni file which now has on-line query and update capabilities. When the final alumni file configuration is completed, the skeleton file information will be moved to the new file through the Batch add option in the QDMS package.

The QDMS files have common definitions, and implementation is the responsibility of the systems manager. Three steps are required by the DBMS to prepare the files for use by the respective administrative offices. They are (in QDMS terms) CONFIGURE, DESCRIBE and ALLOCATE.

The basic ground rules of what users and what terminals have access to specific files controlled by the DBMS are established by the manager, working through a supervisory "account" with the CONFIGURE command.

With this operation — utilizing interactive questions and answers — it took about 10 minutes to organize the admission system. Once the rules are in place, attempts to enter or use data in files not authorized to the user will cause the system to terminate the job and sign the user off the system.

From the managers supervisory "account," the attributes of the records within the file are described through the DESCRIBE command. Of all the parts of QDMS available to the user, DESCRIBE is the only section which requires some experience or knowledge of computer systems.

To take full advantage of the capabilities of the operating system, record restrictions and blocking considerations, one has to be familiar with the way information is stored on the system. QDMS gives the user a full range of options by which to store and compact data. Seven modes of storing data are available.

Once the decision has been made as to where the data will be stored and how it will be stored, QDMS will take care of the packing and unpacking of the data as it enters and leaves the system in all subsequent use of the data management package. For the admissions inquiry systems, it required about 45 minutes to desribe each of the files for the three colleges. In the admissions systems now operating, there are 61 items available for use in the respective offices.

The DESCRIBE command also allows one to modify selected items of the description without having to redescribe the entire file. For documentation, a LIST option is available, allowing multiple copies to be distributed so everyone using the management system will have matching information.

Allocation Process

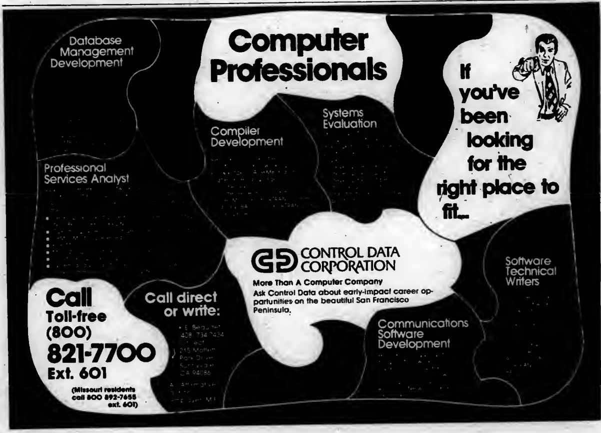
Once the file has been described and record lengths are known, the manager executes the ALLOCATE command to establish the proper amount of space for the file. This takes about two minutes, and consists of answering a few questions on the number of records in the file, the logical record size and the manner in which the information will be stored on the disk (in RSTS/E terms, the cluster size) and the blocking factor.

When the allocation process is complete, the file is ready for use — the owner of the file may begin immediately to add data on-line to the file.

The user commands are ADD, DELETE, CHANGE, INQUIRE, HELP, SORT and REPORT. Use of these commands assumes no prior knowledge of computers and leads the user through the various commands using the question and answer technique.

A one-page sheet is given to each group of new users explaining how to sign on the system and gain entry to the management facilities. This sheet also briefly explains the major user commands available and the options which can be used with each.

(Continued on Page 32)



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Prime Users Supported

SCRANTON, Pa. — PMS-III from Computer Techniques is said to provide interactive inquiry, report and data base management capabilities compatible with all languages and file structures available on Prime Computer, Inc. minicomputers.

The package features full compatibility with the Primos operating system, including the Multiple Index Data Access System (Midas) and I/O handling, a spokesman claimed. PMS-III is based on an internal data dictionary and simple, English-like commands, he added.

Other features include edit, computation, screen formatting and expanded system utilities as well as file creation and reorganization.

The system ranges from a basic package supporting query and report generation from existing files to a full-blown complement of utilities and processors that create and then maintain a data base, according to the firm.

Computer Techniques' software is currently in use in a wide range of industries and applications including manufacturing, retail, medical, general accounting and time-sharing services, the spokesman said.

PMS-III, available now, ranges in price from $3,600 to $9,600 depending on the extent of facilities ordered with the package. Computer Techniques is at 1015 N. Main St., Scranton, Pa. 18508.

'SDSI' Shields Disk Data From Concurrent Updating

SACRAMENTO, Calif. — The Shared Data Set Integrity (SDSI) package developed for IBM OS/VS installations by Duquesne Systems, Inc. is now available from Software Module Marketing, Inc. (SMM).

SDSI is a generalized multisystem ENQUEUE facility that protects data against concurrent updates without locking users out of data unnecessarily. SDSI circumvents the DEVICE RESERVE facility that takes an entire disk volume out of shared use, a spokesman asserted.

SDSI maintains statistics on the ENQ/RESERVES that occur while in operation. These counters may be displayed and optionally reset by an operator command; they should identify those RESERVEs that are suitable for conversion to SDSI control, he said.

Currently available for MVS use only — a VS1 version is expected sometime in the second quarter — SDSI costs $15,800. A basic package that prevents multiple concurrent updates but comes without the RESERVE replacement support costs $9,800.

SMM is in the Crocker Bank Building Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

'Harold' Cuts DOS TP Costs

GERMANTOWN, Tenn. — Developed to be a low-cost teleprocessing (TP) monitor for IBM DOS shops that can't afford similar software already on the market, a package called Harold is now available from Pycco Computer Systems.

Harold was created to work with the company's on-line librarian system, Marian. The two packages will run together in a 40K-byte DOS partition.

But, a spokesman was quick to note, Harold can also be used to support user-written applications as well.

Harold is said to be the 10th TP monitor to which Marian can be interfaced. With a monitor in place, the librarian provides on-line support for add, delete or modify operations on stored data or source programs.

Harold costs $1,500 and Marian is still available for $3,000, the vendor said from 1806 Malabar Drive, Germantown, Tenn. 38138.

DBMS Ties User To On-Line Data

(Continued from Page 31)

Sample runs involving the users' files are attached so they can see the layout as the questions are asked and what the recommended responses should be. So far we have been able to use these run sheets with the administrative staffs in three sessions, each lasting from one to one and a half hours.

We go through the commands using actual data which is to be put into the file. Sessions after the first one have been the most productive because the people have had a chance to use the system, even if they have followed a sample run very closely. They ask "what if" questions rather than no questions at all.

CMC Colleges Associated has been able to bring up two major administrative systems, admissions and alumni, within five months of installation of the computer. A financial reporting system has been obtained from Quodata and will be implemented within the next three months.

We are pleased at the ease with which the users have been able to use the system.

I have seen attitudes change from "I'll never be able to learn" to "What else can we do with our data?" in one week.

Jackobs is the technical director at CMC Colleges Associated in Cedar Rapids, Iowa.

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System Integrates Bank Wire Data

DALLAS – Rockwell International, Inc. has introduced a message system that allows banks to integrate traffic from various wire services.

Called the Rockwell Financial System (RFS) and produced by the Collins Communications Switching Systems Division, the turnkey system integrates message communications coming from the Fedwire, Bankwire II, Chips and Swift bank networks in addition to Telex and TWX traffic. RFS can also be configured to operate on internal private bank nets, a spokesman said.

RFS provides status records for each transaction. It can also produce summary reports for management's use. Operator passwords, access restrictions according to function, dual controls and automatic audit trace recording help maintain security and audit control, the company said.

Bankwire operations typically require specialized operators who must learn to use a variety of terminals and wire service formats. RFS simplifies this procedure with a single, intelligent CRT workstation that can access all wire services, the firm said.

Wire service users with RFS are connected to a bank's DP center, which maintains a data base of customer account information for both internal bank communications and wire service traffic. Payment items are processed automatically, and tasks previously handled manually are processed on the intelligent CRT terminals.

In addition to handling payment messages from wire services, RFS terminals include preformatted CRT screens so operators don t have to memorize various wire service formats.

Three Versions

The system is available in three versions. The RFS-100 includes a single C9200 processor, five CRT workstations – which include both a CRT and printer – and a communications interface for Telex, TWX and one wire service. This basic system costs about $450,000.

The RFS-200 includes up to 50 workstations and dual CPUs and can handle all wire service nets. It costs between $800,000 and $1.3 million.

With two sets of dual processors, the RFS-400 can handle up to 150 workstations. This system costs up to $2 million.

A communications high-level language, described as similar to PL/I, is employed by the systems. Full support for both hardware and software is available under a separate maintenance contract.

First deliveries are set for 1980, and an X.25 capability will be added to the system later that year, a spokesman noted. The Collins Commercial Telecommunications Group can be reached through Box 10402, Dallas, Texas 75207.

Terminal Cuts Keypunchers' Workload

By Brad Scholtz
CW Staff

SAN DIEGO – After searching for a unit that could simplify customer on-line access to general ledger and financial reporting services, Accounting Corp. of America (ACA) settled on a programmable terminal.

Texas Instruments, Inc.'s (TI) Model 742 from its Silent 700 series was the least costly terminal with dual-cassette storage and a built-in, hard-copy printer, according to Donald Schwartz, ACA's vice-president of marketing. The firm considered hard-copy output important for locating errors in input and for creating an audit trail.

ACA customers generally fall into two groups: the customer who mails in data to be keypunched, processed and then mailed back; and the customer whose high volume of input transactions require fast processing and input control.

The second type of customer usually inputs his data into the TI 742 for batch processing at a later time by ACA's host mainframe. By the following morning, the mainframe transmits the processed data back to the 742 in a report format for management use.

According to Schwartz, the customers are not obligated to mail in data according to a rigid timetable; this latitude leads to major fluctuations in ACA's keypunching loads.

As a result, the firm felt the need to upgrade its terminal facilities to minimize problems associated with the swings in traffic volume. Time was being lost because of human errors in customer data preparation. The preparation of data for keypunch operator interpretation and the mailing of data to and from ACA consumed more time.

"We felt our users [scattered throughout the nation] needed a terminal that could store data as it was entered – 1,000 transactions or more – and then transmit it in the evening at high speeds for minimum phone cost," Schwartz explained.

(Continued on Page 34)

IBM Unveils Two POS Systems Aimed at Small Retail Stores

WHITE PLAINS, N.Y. – Two IBM divisions have introduced point-of-sale (POS) systems aimed at small retail stores. The Data Processing Division came out with the 3680 programmable store system, while the General Systems Division announced the 5260 system.

Designed for larger DP users, the 3680 system can transmit data to a central site IBM 370 mainframe. The 3680 includes the 3684 terminal/control unit and the 3683 microprocessor-controlled terminal, which attaches to the 3684. Cash drawers and two wand readers (for either magnetic or optical character reading) are optional.

An on-site system, the 5260 operates with clusters of up to 10 terminals that store data on diskettes; it can also transmit directly to a CPU, IBM said.

The 3684 includes 985K characters of random-access diskette storage for application programs, transaction logs and reports. A bidirectional printer with up to three print stations, an entry keyboard and numeric display comes with the system.

The 3680 can transmit data to a 370 CPU for applications such as inventory analysis, gross profit margin analysis and automated price management, IBM noted.

Two application programs were announced for the 3680. A sales application includes

(Continued on Page 34)

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Terminal Lightens Pressure on Keypunchers

(Continued from Page 33)

Custumer applications required either a programmable or intelligent model of terminal, he continued. Other demands included a high level of user control over computation of dollar amounts; the ability to lead the "nonsophisticated" terminal operator through input fields, while requesting certain information; and defenses against invalid data entry and improper input sequences.

Finally, repetitive information had to be automatically duplicated, and fields not appiicable to the job had to be automatically skipped.

A typical ACA customer environment might be an accounting firm with medium-to high-volume data traffic. At the installation, typists serve as operators for on-site 742s. Each operator enters coded documents such as checks, vouchers and journal entries for the particular client.

After the last batch is completed, the job's accuracy is checked by obtaining grand totals. The Model 742 is then ready fur the next job.

At day's end, the operator switches to on-line mode and goes home. ACA then polls all unattended customer data terminals through the night, initiating transmission with its host CPU.

By processing most data at night, completed reports are on their way back to customers on the following morning, Schwartz said. The Model 742 has reportedly reduced total turnaround time from more than a week to two days.

Two POS Systems Unveiled

(Continued from Page 33)

functions such as operator guidance, credit and check authorization and price look up. The store administrative program provides for inquiry into records on item movement, in-store cash count and loans and withdrawals.

The 3683 with keyboard, display and cash drawer. and the 3684 with those features plus diskette cost $3,225 and $3,950 respectively.

The sales application program costs $4/mo, and the store administrative program is $8/mo. First deliveries of the 3680 system are set for February 1980.

Adaptable Unit

The 5265 POS terminal can operate as an electronic cash register, a microprocessor-based POS terminal and a sales floor data collection unit. It works either as a stand-alone or in a "shared media" cluster.

A user can reportedly tailor the functions of the terminal by filling nut a "personalization questionnaire." Answers are entered on the 5265 keyboard with a special keyboard overlay, IBM said.

Stored on diskette, the transaction log can be transmitted using Binary Synchronous Communications tn a System/34, 5110, System/32, System 3 models 4 through 15, 3741, 3747 and 370. The system includes an 80 char./sec bidirectional printer for sales slips and cash receipts.

Three licensed programs for data preparation, sales audit and merchandise control accompany the Retail Merchandise and Audit System (Rmas). At a cost of $65/mo, $130/mo and $200/mo respectively, the first programs will be available by December.

Other introductions included a System/38 Retail Data Preparation Program to be ready in February 1980 for $85/mo and a System/32 Retail Data Preparation Program to be ready for delivery this month for $65/mo.

A 5260 system with a stand-alone diskette terminal, keyboard and cash drawer costs $3,850 or $131/mo on a three-year lease or $151/mo on a straight rental basis. Deliveries are scheduled for September, IBM said.

Today's Output May Be Tomorrow's Outcast

Keep up to date on the state of output in our February 26th Special Report.

The rapid pace of computer output technology is producing an increasingly varied array of equipment that is making current methods obsolete. There are now nearly 100 computer printer vendors, with more than 300 printer or printer families, using about a dozen techniques, ranging from 10 character/second cylinders and balls to sophisticated 14,000 line/minute laser xerography. In addition, manufacturers continue to pump out a wide range of COM units, microfilm equipment and CRT's. And many of these complex systems are becoming feasible and affordable for both large and small companies.

Computer Output Equipment is the topic of our February 26 *Computerworld* Special Report. Edited by Howard Karten, the report will be examining the increasing variety of computer output equipment, with problem-solving tips by users, as well as advice from vendors on topics like:

- *Output selection: hacking through the equipment jungle*
- *Microfiche and microfilm: designing and planning a COM system*
- *Color CRT's and their newfound applications*
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"At each of the regional offices, dealer orders for parts are entered in the local Series/1, which analyzes them for accuracy," says John R. Cola, director of information systems. "Needed data changes can then be made on the spot. After further processing by a System/370, documents are prepared by the Series/1 for quick shipment of the orders to the dealers.

"Similarly, the processing of the dealers' monthly financial statements, each of which includes over 600 items, is expedited by our Series/1 network," adds Mr. Cola. "We believe this kind of close regional control of data through distributed processing is vital to our objective of topnotch service to our dealers and their customers."

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John R. Cola, Director of Information Systems, Nissan Motor Corporation in U.S.A., Carson, California

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Dual Mini Front End Helps Anxious Farmers Get Machine Parts Fast

MOLINE, Ill. – By adding a dual minicomputer front end to a network, Deere & Co., a manufacturer of agricultural machinery and industrial equipment, has improved inventory control and parts reordering services for dealers throughout the U.S. and Canada.

The system gives the dealer full control over his own inventory levels while automatically reordering necessary parts, reducing labor-intensive paperwork and providing effective management reports. The front end is said to cut transmission costs by 30%.

"In our business, a strong dealer organization is vital," according to Harold Epp, Deere's manager of dealer services. "Farmers cannot wait days – much less weeks – for parts during planting or harvesting, and contractors will not tolerate parts delays during the construction season. Consumers expect replacement parts to be readily available."

To meet the varied requirements of each dealer, Deere & Co. introduced a highly flexible, automated inventory/order system called the Dealer Parts Automatic Replenishment Transmission System (Dparts) in 1971.

The system used an IBM 360/65 with the IBM Telecommunications Access Method (Tcam) procedures to control the transfer of messages between dealer Teletype machines and the mainframe in Moline. Within the next five years, the number of Deere dealers using the system grew from 35 to about 700.

Problems Led to Upgrade

"With dealers joining the system every week, we anticipated that 1,100 dealers would participate by the end of 1979," Larry Woods, manager of distributed computing, explained. "We were also experiencing problems with Tcam, software maintenance in one portion of the program affected dealers' polling routines. Moreover, malfunctions or maintenance of the mainframe inhibited polling.

"We upgraded the mainframe to an IBM 370/168 and added dual Digital Equipment Corp. minicomputers linked with the Decnet communications software," Woods continued. "The dual minis gave us redundancy and allowed us to separate the polling from the mainframe."

The Dparts front-end network consists of the two DEC PDP-11/40 minicomputers, each with 196K words of main memory, three RP02 10M-word disk drives, a TE 16 tape transport and a VT52 CRT terminal. Fourteen dial-up lines on each machine provide communications with the dealers' terminals through autodialing, full-duplex modems at 110 bit/sec.

"Polling is conducted in a true, full-duplex mode," according to Woods. "We simultaneously receive the dealers' transactions and transmit messages for previously ordered parts not available at the dealers' serving parts depot. Compared with the former system, our overall communications costs were reduced 30%."

The PDP-11/40 minicomputers run under DEC's RSX-11M real-time operating system. The software permits concurrent processing of multiple, memory-resident tasks and event-driven priority scheduling.

There is a flexible file system as well as record-oriented or block-oriented I/O services. Decnet supplies communications protocol between the minis and permits changing of backup files.

"We purchased Decnet, rather than designing our own link, because of staff size," Woods noted. "We allotted one staff programmer and two contract programmers to the enhancement.

Expedient Choice

"It was expedient to use an operational software package. The Decnet down-line loading capability facilitated program changes during development, and we wanted Decnet experience for a future tractor assembly plant," Woods explained.

Transaction file transmission from PDP-11/40s to the IBM 370/168 central computer is accomplished with JES3, which provides supplementary job management and controls communication between the processors and 16 remote job entry (RJE) stations in Deere parts depots throughout the U.S. and Canada.

During the day, dealer parts department personnel record transactions on their terminals from counter tickets. The transactions are punched into paper tape or recorded on cassette, depending on the type of terminal, as they are entered on the keyboard.

By evening, all transactions are recorded, and the terminal is placed in unattended mode for response to polling from the PDP-11/40s in Moline.

The PDP-11/40s poll the dealers each evening, using telephone number files common to both processors. One mini serves as a master processor, controlling telephone number assignments between the two.

Polling Order

Polling order is determined by dealer location. It starts in the Eastern Time Zone and progresses westward at a pace that allows dealers to record their transactions prior to the poll.

The Wats lines have two rates so the system starts with the lower cost line. Should an inordinate delay occur, the system automatically switches to an appropriate higher cost line.

Incoming transactions are stored on PDP-11 disks, while messages to be sent to the dealer – also on disk – are automatically transmitted to the dealer's terminal. Polling for the 1,100 dealers is completed sometime after midnight.

The dual minicomputer front end supplies Deere personnel with system status reports including the number of successful polls, of modem failures, of line faults and other necessary data to ensure proper operation. When all dealers in a Deere marketing unit have been polled, the files for that area are transferred to the IBM 370/168.

Every two weeks, parts are shipped to the dealer to bring his inventory up to his desired level. Delivery receipts are entered at the RJE stations to update inventory files in the IBM 370/168.

CRT Screen Guides Customers

NCR Unveils Self-Service Financial Terminal

DAYTON, Ohio – NCR Corp. has announced a self-service financial terminal with a CRT screen that flashes instructions to customers to guide them through transactions.

With the Model 1780, customers can make deposits and withdrawals, transfer funds from one accuunt to another, check on their accuunt status and make payments on luans and utility bills, the firm said.

The 1780 can be used as a cash-dispensing unit and upgraded to become a full-scale automated teller-machine (ATM). It relies un the NCR Microcomputer System (MCS) for its logic and control.

The system can uperate on a free-standing basis or linked to a mainframe so that as transactions occur, the data is forwarded to the CPU for processing. When operating as a free-standing unit, the 1780 records transactions on a magnetic cassette unit, and the data is processed later at the financial institution's DP center.

To use the system, the customer inserts a plastic card into a slut. The terminal flashes a message asking the customer to enter his secret number via the unit's keyboard. Once this is done, the terminal advises the customer of each successive step.

The 1780 accommodates plastic cards using the standard methods of magnetically encoding information adopted by commercial banks and thrift institutions, NCR said.

The ATMs can also handle two different currency denominations and dispense bills individually rather than in prepackaged envelopes. Currency can be loaded into the units with removable currency cassettes.

The 1780's matrix printer has a 96-character set and allows the financial institution to print descriptive receipts.

Both the 1770 (a self-service financial terminal designed for use in a lobby or other secure area) and 1780 terminals use the same controller and can be mixed or matched. In each case, service to the customer is enhanced, the flow of information is improved and the amount of paperwork is reduced," an NCR spokesman said.

In a typical configuration of four 1780s and a controller, the system costs between $22,685 and $27,040 per terminal, depending on chosen features and options.

The system will be available for customer delivery in the second quarter of 1979.

Coupler/Modem From Tek-Com Makes Debut

SUNNYVALE, Calif – Portability and reliability are reportedly two features of Tek-Com, Inc.'s newly announced TC3002 acuustic coupler/modem unit.

The TC3002, compatible with Bell 103F and 113A units, uffers a 300 bit/sec asynchronous data rate, switch-selectable originate and answer modes, acoustic and Data Access Arrangement/private-line interfaces and both half- and full-duplex operation, according to the firm.

Simultaneous EIA and 20ma interfaces, power and carrier interfaces and -50dBm sensitivity are also provided. The unit was designed tu operate "over wide variations in temperature, data rate, line voltage and received signal amplitudes," according to the firm.

The TC3002 acoustic coupler/modem costs $295 from Tek-Cum at 1147 Sonora Court, Sunnyvale, Calif. 94086.

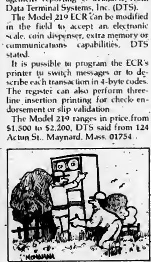
Register Ready For Food Stores

MAYNARD, Mass. – An electronic cash register (ECR) that reportedly offers food store operators the benefits of alphanumeric printing, food stamp processing, tax reckoning and management reporting is available from Data Terminal Systems, Inc. (DTS).

The Model 219 ECR can be modified in the field to accept an electronic scale, coin dispenser, extra memory or communications capabilities, DTS stated.

It is pussible to program the ECR's printer tu switch messages or to describe each transaction in 4-byte codes. The register can also perform three-line insertion printing for check endorsement or slip validation.

The Model 219 ranges in price from $1,500 to $2,200, DTS said from 124 Acton St., Maynard, Mass. 01754.



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HP Announces Three Terminals for Plant Floor

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced three on-line terminals designed to capture industrial information where it originates.

Aimed primarily for use in manufacturing companies, both on the factory floor and in offices, the terminals' modular construction and 60 combinations of options make it possible to adapt them to most tasks, from machine-shop management to reporting laboratory test results, the company claimed.

Features include an optional multifunction reader that accepts marked or punched cards and Type III punched badges, a Type V badge reader, a choice of numeric or alphanumeric keyboards and CRTs, alphanumeric printer and a choice of data communications connections using a built-in data link and associated interface.

Operator Instructions

The HP 3075 A is a desktop terminal for use in such applications as finance, stock control, order processing and purchasing. Its user-definable prompting lights instruct the operator what functions to perform and in what order, while its user-definable keys assist data entry.

The 26 keys on the alphanumeric keyboard can be set either to user-defined operations or to alphanumerics using a shift key. The optional printer can be used to deliver a record of each transaction or a job-routing ticket, the firm said.

The HP 3076A is a wall-mounted version of the HP 3075A. When fitted with a multifunction reader and printer, it can be used to record work in progress in a machine shop.

The HP 3077A, also wall-mounted, is a time-reporting terminal fitted with a Type V badge reader or a multifunction reader. It can be used for employee time reporting or to control access to restricted area, actuating a relay built into the wall-mounting cradle after identifying the badge it has read.

The three terminals can be connected to HP systems and other CPUs. An RS-232C-compatible interface and a built-in data link are standard equipment.

Through a rear connector on the terminal, the user has a choice of multidrop, multipoint or point-to-point connections.

Multidrop connection, using the data link, enables terminals to be connected along a link that can be up to five miles long. Multipoint connection enables any of the terminals to be daisy-chained on the same line, along with terminals of the HP 2640 series, either hard-wired or via half-or full-duplex modems.

Replaces Teletypewriter

Point-to-point connection enables a terminal to be a direct replacement for a teletypewriter device.

The standard HP 3075A desktop terminal costs $2,090. The HP 3076A wall-mounted terminal is priced at $2,475 and the HP 3077A time-reporting terminal costs $2,530.

For the HP 3075A and HP 3076A, an optional alpha keyboard is $110, an alpha display costs $490, a multifunction reader is $715, a Type V badge reader costs $360 and a printer costs $440.

For the HP 3077A, substituting a multifunction reader in place of Type V costs $350 and an alpha display costs $605.

First customer deliveries will begin in February. HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Fast Printers Gain Interface

FAIRFAX, Va. — Air Land Systems Corp. has introduced a microprocessor-based interface called the MPC-15, which is designed to provide a serial data interface for the Dataproducts Corp. 2230, 2260 and 2290 high-speed printers over communication lines having complex protocols.

Memory Size

To accommodate the data rate of the printers, the MPC-15 uses a 128-character memory that can be accessed by the printer at its own rate up to 500 kHz, the firm said. Printer data is output through TTL-compatible drivers.

The MPC-15 is designed to receive its power from the Dataproducts printers, although stand-alone operation is available, according to the firm.

The MPC-15 is available for $1,810 from Air Land Systems at 2820 Dorr Ave., Fairfax, Va. 22031.

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Performance Almost Trouble-Free

User of IBM 360/65 Won't Give It Up

By Howard A. Karten
CW Staff

CHICAGO – The IBM 360/65, announced approximately 14 years ago, was for a long time among the most powerful systems offered by IBM. Despite significant technological advances, about 1,000 users are still running 360/65s today.

Why would a user choose to keep one of these systems when faster, more powerful systems are available?

For First Financial Accounting Corp. (FFAC) here, "the 360/65 isn't obsolete. There are many ways to get a good deal of work out of a Model 65 on a cost-effective basis," according to R.E. McCallister, senior vice-president of the company.

"For example, we run an operating system called DOS/MVT written by Software Pursuits, Inc. of San Francisco. It gives us 12 regions, so if we have enough peripherals we can run 12 jobs simultaneously," he said.

McCallister acquired his Model 65 in May 1975 from Dearborn Computer Leasing Co. Except for some difficulties with the Model 1052 console, he has had virtually trouble-free performance from the system, he said.

McCallister explained that his background in DP helped him pick the Model 65 – he worked for IBM for 10 years as a systems engineer, manager, salesman and in other capacities. "The fact of the matter was that the Model 65 processor was one of the best boxes IBM ever built. When you look at price/performance, it is still one of the best things you can buy," even considering the 370 and 30 series.

Improvements Sought

Since McCallister particularly likes the performance he gets from the 360/65, he is constantly seeking ways to improve the configuration while retaining the CPU. "We are presently entertaining the idea of replacing the IBM storage on the system with independent memory," he said.

That change is expected to give FFAC a more reliable product, one that will just about pay for itself in terms of expense reductions or avoided expenses. This will be particularly true when FFAC merges with another, similar operation, which will happen very shortly he said.

"There are too many cost-effective ways to use a Model 65 [to give it up]," he added.

Asked if his philosophy in acquiring software and hardware was to go with independent sup-

(Continued on Page 46)

Hints Given to Boost Entry

By Jay Woodruff
CW Staff

CAMBRIDGE, Mass. – High performance and professionalism in data entry demands good scheduling, control over worker productivity and a spirit of cooperation between data entry personnel, their managers and other DP personnel, according to Ivor J. Brownlee, manager of document processing at Blue Cross/Blue Shield of Indianna in Indianapolis.

Speaking at a Data Entry Management Association (Dema) regional meeting here recently, Brownlee suggested several ways to increase data entry productivity that included planning for the long range and taking advantage of workers' periods of greatest productivity.

"Most data entry managers make short-range daily plans, but short-range planning does not take everything into account, and managers often can't meet their production schedules," he said.

The first step in curing the problem, he indicated, is to draw up a long-range schedule that indicates exactly what documents are to be entered over a period of time. A good schedule should show how long it will take to key in and verify each document.

Sick time, vacations and such questions as whether the data entry department's best keyers are working up to their averages all have an effect on meeting production timetables, he pointed out.

Brownlee also suggested that data entry managers take advantage of their personnel's greater productivity periods, in the morning and just after lunch, by scheduling their work load accordingly. Those times are also the best ones to constructively criticize their work, he said.

CW
At Dema

Managers should avoid the temptation of reprimanding an employee just before he goes home because that is an emotional low point in the day, he added.

The Blue Cross/Blue Shield document processing facility is responsible for data entry, microphotography of documents and records retention. It maintains a professional attitude by treating users as clients, Brownlee said.

"If you have a schedule that takes care of the work your users require, they will do their best to work with you," he told data entry managers at the meeting.

But sometimes it is necessary to "be a little hard-nosed with your clients to get them to understand

(Continued on Page 47)

Microcode Fundamentals — Part 2

Two Choices: Horizontal or Vertical

By Mike Senft
Special to CW

Mike Senft, director of marketing with Nanodata Corp. in Williamsville, N.Y., last week discussed the flexibility that microcode offers users and vendors. This week, in the second part of a three-part series, he discusses some types of microcoding and their advantages and disadvantages.

There are two alternatives to the hard-wired controller, vertical and horizontal microcode. The alternative chosen by a manufacturer is in large measure based on its predetermined hardware costs and market strategy in building and selling the product.

Vertical microcode is similar to ordinary machine language coding and works in conjunction with a "simple" control unit. These instruction sequences typically are "single-threaded," requiring a number of separate instructions for each single machine language instruction that must be executed.

Since this clearly will slow down the total instruction execution, the design engineer must compromise on what decisions the microcode will make and what will be predetermined by the control unit

To satisfy design goal criteria, the manufacturer seldom needs to use a control word memory size larger than 18 bits, with each microinstruction made up of one operation code (opcode) and one or two operand fields. This form of programming is comparable to machine language coding, and experienced programmers – systems programmers, for instance – usually have little problem adjusting.

Fewer than 2K words of vertical

(Continued on Page 46)

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Vertical, Horizontal Microcode the Alternatives

(Continued from Page 45)

microcode are usually necessary for a successful design, and this form of microcode is usually found in less powerful, less costly systems. The IBM 370/125, for example, has a 16-bit vertical microinstruction.

Horizontal microcode effectively is the control unit directly driving the hardware. A horizontal microinstruction is executed by gating it to a register from which many signal lines or combinatorial logic controlled paths (e.g., ALU and shifters) are directly controlled. Each bit position of the word can be associated with control of a separate signal.

Horizontal microinstructions usually require a very wide word, typically 64 to 150 bits in length. This length and the number of combinations associated with it — 2^{64} to 2^{150} — provides a tremendous amount of flexibility.

In addition, since all bits in a microinstruction are executed concurrently, tremendous parallelism — and, therefore, the potential for a very powerful processor — exists.

If sequencing is required, however, a series of microinstructions will still have to be executed in a manner similar to vertical microinstructions.

A drawback to horizontal microinstructions is that they are difficult to code because of their size, parallelism and intimate association with hardware parameters, such as timing. They are also more expensive to incorporate into the product design and as a result are often limited to more powerful systems.

IBM's 360/67, for example, had a 100-bit horizontal microinstruction. Without the flexibility and parallelism of horizontal microinstructions, it would not have been practical for IBM to have emulated some of its older systems even on its newest, most powerful products.

Veil of Mystery

For many years, IBM uncharacteristically sought to contain knowledge of microcode. The subject was covered with a veil of mystery, and warnings were issued regarding the "inherent danger" in exploring the unknown.

With the passage of time and the entry of competitors into the field, IBM's reasons for this course of action have become apparent.

Because of the overhead imposed by microcode, a hardwired system can be constructed to be compatible with but faster than a microcoded machine. Furthermore, if it takes advantage of software developed and sold by another vendor, it can be sold for less.

This is offset, of course, by the possibility of more rapid obsolescence, as well as by the difficulties and expense involved in incorporating enhancements. The Amdahl Corp. systems (which do not use microcode) are an excellent example of the potential speed improvement that can be obtained while sacrificing flexibility.

User Interference

What if a sophisticated user were to get into the microcode and modify the performance of his system himself? The perpetual upgrade of the system would be delayed or negated; to the manufacturer, that means lost or delayed revenue.

To protect themselves against this, manufacturers take one or more of the following steps:

- They "burn" the microcode into read-only memory at the factory. This protects the microcode from destruction or modification at the user site; to the end user, these fixed microprograms are considered inflexible hardware.
- They withhold or make it difficult to obtain software and documentation tools, preventing a user from modifying the microcode.
- They refuse to support systems whose microcode has been modified. Vendor claims that customer engineers can no longer effectively maintain such customized machines because the diagnostic routines will no longer work may or may not be valid.

It is interesting to note that there are at least nine user-programmable systems available today whose vendors encourage users to add to or alter microcode in order to improve or otherwise enhance system performance.

Three Obstacles

Although systems are now available with user-writable control memories, there are still obstacles impeding the general practice of end-user microprogramming. However, in the ever-increasing competitive marketing environment, many of these deterrents are eroding as the prospects for sales increase.

The three most commonly encountered obstacles are:

- Limited manufacturer-supplied support tools and documentation.
- Control memory size that satisfies the manufacturer's requirements but not necessarily those of the end user.
- A machine language assembler rather than an "ease of use" compiler. This is partly necessitated by execution speed degredation, which inefficient compiler-generated microcode would cause.

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User Hanging Onto 360/65 Cites Trouble-Free Use

(Continued from Page 45)

pliers, McCallister replied emphatically, "Oh yes, it definitely is."

Two purchases are good illustrations of this philosophy — 3330-compatible disk drives and the replacement of the 1052 console that came as original equipment on the Model 65.

The 360/65 predates the introduction of Model 3330 drives by several years; consequently, it will not accept a true plug-compatible 3330. However, there are ways of interfacing the compatible drives without an excessive amount of work.

"It's really a function of how the vendor chose to perform the attachment to the selector channel. Those vendors who decided to supply the necessary microcode in a disk controller to handle signals that would be inappropriate from a block multiplexer channel [never] have a problem," McCallister explained.

"For example, California Computer Products, Inc. makes a 3330-type drive that is a functional equivalent in every way to a 3330, and that's the problem — it can't be attached to a 360."

McCallister knows. He tried, and it didn't work.

As a result, he turned to the Memorex Corp. 3675, a 3330-type disk drive. FFAC did a Sysgen to accommodate the drives, and they have been transparent to the system since installation.

'Rotten Device'

In a similar fashion, the company's experience with the IBM 1052 console demonstrates an empirical, tough-minded approach.

"The 1052 is a rotten device; it was never built to take the kind of pounding we give it. At one time I had three separate [1052] assemblies in this shop. We got so good we could yank one out and install the next one in 15 minutes," McCallister recalled.

To get around this problem, "we started casting about for a better solution, for a more reliable console, when a software product called Docs came to our attention. The product [written and sold by CFS, Inc. of Brookline, Mass.] allowed our operators to run the system with a CRT as a console.

"It cost me $170 per month, and it's worth every nickel. We have been using it for more than three years; it meant I was no longer held up by the mechanical reliability of a 1052," he said.

MIT Planning Conference On CAD/CAM Graphics

CAMBRIDGE, Mass. — MIT's Department of Mechanical Engineering will hold the first in a series of annual conferences on graphics in computer-aided design/computer-aided manufacturing (CAD/CAM) systems here April 9-11.

The objective of the conference is to establish the current state of knowledge in the field and to assess major problem areas for future development efforts, the department said.

The conference will provide technical information for prospective users as well as for experienced practitioners through formal technical presentations and informal discussion.

Scheduled Topics

Among the topics to be discussed are current applications of computer graphics systems to the design, analysis and manofacture of mechanical components and assemblies and applications of graphics to various facets of integrated circuit production.

Geometric modeling and emerging technologies in graphics will also be discussed, the department noted.

The program, which will be chaired by Prof. David C. Gossard of MIT, is being presented in cooperation with several major firms, including General Electric, Inc., Westinghouse, Applicon, Inc. and Computervision Corp.

Advanced registration is $95 if received by March 15; the fee is $115 after that. A one-day registration of $50 is also available. Student fees are $25 for the entire conference or $10/day.

Further information is available from Gossard at MIT 3-455, 77 Massachusetts Ave., Cambridge, Mass. 02139.

Exchange to Hear Hopper Tomorrow in Los Angeles

LOS ANGELES — Capt. Grace Murray Hopper of the U.S. Naval Reserve will address the 30th international meeting of Exchange, the Xerox computers group, when it meets Jan. 30-Feb. 1 at the Marriott Hotel here.

Other schedoled highlights inclode a software trade fair at which attendees can exchange information and innovative software products; a planning committee forum where user concerns and problems will be discussed and formally presented to Honeywell, Inc. for reply; and specialized meetings for general interest groups to promote new ideas and solve common problems among users sharing the same types of applications.

Honeywell took over the Xerox user base in 1975, when that firm dropped out of the computer systems market.

Also featured will be demonstrations of the CP-6 operating system and a tour of Honeywell's Los Angeles Development Center.

The registration fee for the meeting is $35 per day or $70 for the entire meeting, including meeting materials, lonches and receptions. Further information is available from Ron Miller at Honeywell, Inc., P.O. Box 6000 (M.S. T60), Phoenix, Ariz. 85005.

Dema Gets Hints On Productivity

(Continued from Page 45)

what yoo reqoire from them to get workdone on time. Users don't get blamed when work is late. Data entry does."

In order for upper management to have a complete picture of the jobs performed by the data entry department, the data entry manager should be able to account for every aspect of its performance, Brownlee said. For example, "keep a log of equipment downtime to substantiate complaints to management. If a vendor says equipment is going to be op 99% of the time, prove that it is or isn't," he advised.

Put It in Writing

Data entry can run more efficiently if personnel pot orders in writing. "There is no chance of it being forgotten when yoo write it down," he noted.

Brownlee suggested additional ways to run a better data entry department. Decision meetings shoold always be held in the morning, he said, when the mind is freshest. Daily, weekly and monthly logs of data entry personnel's work provide factual evidence of how well they are meeting the job's requirements.

Personnel with excellent work records shoold be commended for their work; their importance, which he said is not often recognized by users and company officials, should be publicized.

Sensitivity to individual workers' problems goes a long way toward creating a good working environment, he added. "I make a special point to ask how my employees are doing. I know everybody by their first names. If someone has been sick, I make an effort to let him know someone else cares," he said.

A well-run data entry operation, whose performance is documented by good recordkeeping and tight control of production schedules will get the high respect for which data entry personnel have been striving, Brownlee said.

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Names, Medical Data on File

System Speeds Search for Kidney Recipients

PARIS — When a kidney becomes available for a transplant; a compatible recipient must be located in the fastest possible time because the operation will not be successful unless it is completed in 20 to 24 hours.

In France, this problem has been solved through a real-time system known as Ritran that rapidly selects those persons with the most compatible medical characteristics from a list with an average of 1,800 possible recipients. Ritran picks out a number of names, but the physician in charge of the transplant operation makes the final selection.

The list of possible recipients and their medical data is kept on magnetic tape in a direct-access file of a Univac 1108 mainframe owned by Air France and located at the airline's computer center in Valbonne. The file can be accessed by physicians on a round-the-clock basis.

The transplant service is managed by Association France-Transplant, headquartered at the Saint-Louis Hospital in Paris. Air France provides its computer service o the association.

Twenty-six medical/surgical teams throughout France and in Switzerland, Holland and Spain use teletypewriter terminals to communicate directly with the 1108 system in Valbonne and with each other.

Finding a 'Best Match'

Upon receiving the characteristics of the donor kidney, the system searches the tape file and responds with a list of coded data on persons with the same or very similar compatibility features.

The recipient file lists the person's name, country, city, sex, birth date and transplantation team. The essential medical data includes blood group, urgency and Human Leukocyte Antigens (HLA) — the individual identifying cell markers that are used as compatibility identifiers. The system is used to try to get a "best match" that will minimize the dangers to the recipient.

The list of recipients is updated daily through the teletypewriter network, using a program known as Ritrec.

About 500 kidney transplants are performed yearly in France, and most of the recipients are selected through the association. On an average day, the Univac 1108 processes two to four inquiries concerning recipients.

The success rate on renal transplants in France is about 60%, judged over a long time period.

The association was created in 1969 to coordinate the work of the various medical/-surgical teams performing kidney transplant work in France, as well as that of other European organizations engaged in similar activities.

Another version of the Ritran program keeps on file a choice of compatible blood donors for persons who may need transfusions of special types of blood cells, such as leukocytes, which help maintain immunity to infections, and platelets, which function during blood clotting.

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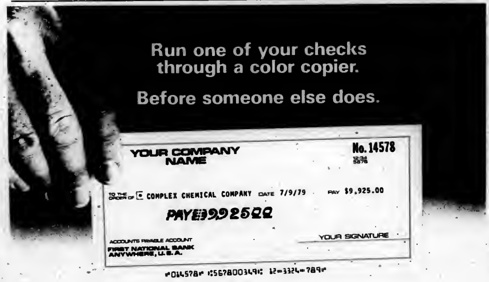

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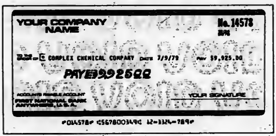

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Jeans Maker's DP Staff Pegs Growth Problem

By a CW Staff Writer

SAN FRANCISCO — Rapid changes in DP concepts make it difficult for DP managers to simultaneously stay abreast of what's going on and provide service to their users. This problem is compounded when their businesses are also changing and growing rapidly.

One way to keep up is by being particularly cognizant of user needs. The DP team at Levi Strauss & Co. has kept abreast of changes with an order entry system that takes perhaps the ultimate step in "putting DP power in the hands of the user."

When the system is in full-scale operation shortly, each member of the company's sales force will have a Texas Instruments, Inc. Silent 700 terminal to communicate order data with company plants and headquarters.

Levi Strauss, a nationwide maker of jeans and other casual clothing, is headquartered here and has manufacturing facilities in several locations across the U.S. At headquarters, the company runs a 6M-byte IBM 370/168 and a 4M-byte 370/158, it has 370/145s in Arkansas, Nevada, Texas and Kentucky.

Before installing its national order entry system, the company relied on the U.S. mail to move information between salespeople in the field and company headquarters.

Ten Days Off Cycle

"In the 'old' method of doing business, the salesperson goes to the customer, writes up an order, mails it to the distribution center [warehouse] and eventually gets back an order acknowledgment. That whole process — with Uncle Sam in it — can take 10 days," according to Rich Merz, advanced technology manager.

"By giving the salespeople information at their fingertips with the terminals, we've taken 10 days off the confirmation cycle. So if there is a product that is not available in the time frame the customer wants it, he knows it immediately; also, the customer can suggest substitutes," Merz explained.

James Matteoni, Levi Strauss' director of information services, said his aim in running the data center is "to provide the people who operate the company with accurate information as quickly as they can get it and give them the criteria they need to make daily decisions.

Reliance on Service

Running a DP center with outlying sites means the operation is particularly reliant on service. Almost all the development work is done in San Francisco by the 110 programmers working for Matteoni; the other sites typically have only one or two programmers.

"If we decide to put a plant in Podunk, I know IBM is going to be there, but I don't know that Company X or Y or Z will be available. We can't worry about our vendor; IBM's service is one less thing to worry about, if it does its job right," Matteoni said.

"If I had one computer and no others, I probably wouldn't be with IBM. But since we're in so many areas, with IBM's service, you can't go wrong. It costs you more, but you're going to get something for that [investment]," he added.

Despite the advanced software and hardware the company uses — it is putting an IBM 3031 in its Kentucky plant, for example — the company is "not necessarily . . . particularly creative or innovative, although we have done two or three innovative systems," Merz said. Rather, he indicated, the DP operation tries to provide DP business tools for the company.

"Users determine what we do," Matteoni said. "Priorities for a new system come from users themselves. They determine what they want and set it at a proper priurity. We determine 'Is it a profitable project?' "

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THE NEW SOFTWARE ECONOMICS

PART 4

By Werner L. Frank

IN DEPTH
IN DEPTH
IN DEPTH

Why are the obvious economic advantages of packaged software not more substantially recognized and embraced? In the previous three parts of this In Depth, we have made a strong case for the importance of the software product as the only near-term means available to the user for controlling the increasing cost of data processing. We have also shown that users' expenditures for such products, compared with those for hardware and user-developed custom software, are pitifully small.

We have discussed the performance and financial structure of the software product sector and its attempt to build an industry alongside the more entrenched hardware and data services components. Demonstrated success has been cited for a number of firms and associated software products.

Furthermore, the financial analysis suggested vendors can be equally successful in all component sectors of the DP industry.

Yet I believe the software product industry faces substantial problems, including a number of regulatory issues, the presence and actions of the industry leader, IBM, and certain inherent industry factors.

Resolution of these issues is necessary if the software product is to continue to fulfill its promise. An educated vendor and user are requisite for achieving such understanding.

Regulatory Issues

There are three regulatory issues confronting the software products industry: protection, taxation and accounting.

In earlier sections of this series, when software and hardware were compared, it was stated that each deserves at least equal treatment and recognition. There is, however, at least one major area in which this has not been the case. This is protection of the proprietary interests of software innovators.

Specifically, the issue is the granting of patents for software-implemented inventions. A case in point is the recent rejection of such a claim by the Supreme Court (in Parker vs. Flook). The U.S. Patent Office, along with the Computer and Business Equipment Manufacturers Association, argued against the claim. The Association of Data Processing Service Organizations (Adapso) filed an amicus curiae brief in support of the petition.

In the brief, Adapso called itself an association of "companies engaged in building and manufacturing software machines for which profit-conscious companies will and do expend money." It went on to claim that "computer innovations embodied with stored computer programs are legally entitled to the same patent protection as innovations embodied in wire-connected electronic circuits, for technologically 'hardware' and 'software' are equivalent."

The argument continued, stating, "Patent protection for software is vital to the health of the data processing industry. In a field dominated by the hardware manufacturers, the growth of the small independent software company has been severely hampered by the bundled practices of the hardware manufacturers which continue to this day in the systems programs area. Only through the availability of protection for their products can the software producers hope to bring competition to an industry that sorely needs it

"To a financial giant, the economic value of a patent may not loom large, to the small software product companies upon which the future of the development of quality software depends, the value of the patent in financing a small company may well spell the difference between life and death. To banks and financial institutions, the existence of a patent or even the potentiality of obtaining one may well be a decisive factor in determining whether a loan should be granted. To prospective investors, a patent or the possibility of obtaining one may be the principal element in the decision whether to invest."

Software for sale is the best bargain in town and the most underpriced property ever developed in any industry, according to Werner L. Frank, executive vice-president of Informatics, Inc.

This week, in the final part of a four-week series, Frank tells why after exploring the problems and promise of the software products industry.

Adapso asked the court "to treat the software technology equal to the hardware technology — no better — and no worse."

The opposition argued that software is a "mathematical algorithm that is conventionally implemented in a general-purpose computer" and therefore disagreed that software is a "machine." It maintained that alternative means of protection are available to software companies in the form of the trade secret laws and copyright procedures.

Taxation, Accounting Principles

Taxation of software products is the second issue facing the software products industry, and it takes three forms. The first is the sales or use tax applied at the time of purchase; the second is the property tax; and the third is the investment tax credit.

With respect to the sales and property taxes, the industry has resisted the taxing authorities, mainly because of the inequities that abound — the negatives of the tax itself are not compensated by positives that may be available to the industry.

Why should a sales or property tax be put on an item which does not also gain the respect of regulatory agencies when it comes to recognizing software as a balance sheet asset or as an item qualifying for the investment tax credit?

It would seem that, in this case, software takes all the lumps, whereas hardware receives all the benefits.

And, finally, there is the accounting princi-

(Continued on In Depth/2)

(Continued from In Depth/1)

ple issue. Should software developed by an organization for its own exploitation or for marketing to others not be recognized as a capitalizable asset subject to normal amortization? This has been an important focus for many software product companies whose position was recently presented to a number of governmental bodies by Adapso.

The issue is one of capital formation, and it affects the ability of young and small companies to amass sufficient capital to conduct their growing software product business. Basic to the problem is the attraction of capital, either in the form of debt or equity financing. However, because of the unfriendly regulatory environment, the industry believes it has been significantly damaged in its attempts to attract such capital from the investment community.

In most cases, the rationale supporting positive action is a psychological one — positive recognition of the worth of software through patent protection, the payment of taxes and the recording of balance sheet assets so as to positively influence investors. There are industry proponents for each of the above topics.

There are also those who question the validity of the issues themselves. In this latter group one can find views such as:

- "Existing copyright and trade secret laws provide sufficient protection for the proprietary software owner."
- "Sales and property taxes should not be imposed since software is not a 'tangible' possession. Paying these taxes to attain the investment tax credit is not worth the effort."
- "Capital formation is not hindered by the conservative statement of balance sheet assets."

A number of specialists in legal and tax issues related to the computer industry have advised that it is unproductive to attach definitions or terms to software based on existing notions associated with other products or services. Rather, they suggest that software be allowed to develop its own unique characterization, accepting whatever burdens and/or benefits are appropriate to this new entity.

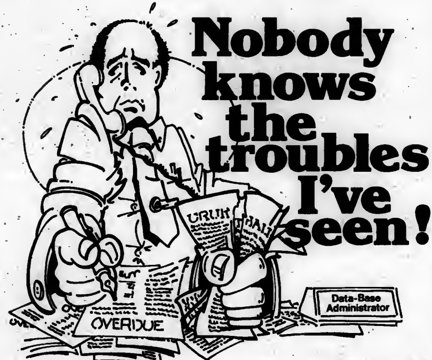
The resolution of these issues clearly will have an impact on both user and vendor. The purchase tax issue alone has a significant effect on the user, and the property tax could be formidable for the seller.

IBM Issues

IBM's major position in the overall data processing industry also makes for a special situation with respect to the software products sector. There are basically three IBM issues that bear on the viability of independent supliers of software — the umbrella, competition and account control.

The umbrella is a pricing problem. Because of its enormous size and unencumbered operation, IBM wields muscle and flexibility with respect to the pricing of licensed programs.

In 1969, during the restructuring of the industry as a result of the unbundling of hardware and software, the price of hardware decreased by 3%, implying this was the cost associated



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with the newly priced software. Industry experts, however, looked toward a 20% reduction in monthly rental rates, approximating their estimate of the software portion of the then-established bundled price.

As we have pointed out before, the average monthly fee charged by IBM for its perpetually licensed software is $400, which seems unreasonably low. Furthermore, there is no multisite discount.

Of course, the low price may be deceptive since there are no prohibitions in periodically raising the license fees. For example, in the past five years the fees for certain critical IBM-provided software in the data base and teleprocessing monitor areas increased by 30% to 40%.

The independent software product industry would find it difficult to grow if it were dependent upon low-priced leases. This is evident from the financial analysis in Part 3 of this series, in which the substantial cash flow needs of the software product vendor were shown.

Lower Standards

The second IBM issue that affects independent software vendors is competition. As elsewhere, IBM sets business standards. Unfortunately, in the case of software products, the IBM standard falls far below users' expectations of the independent software product manufacturers.

For example, would the independent software supplier license agreement be permitted to contain the following terms, which are found in the standard IBM "Agreement for IBM Licensed Programs" (Form Z120-2800-0):

(1) IBM has the option of changing the monthly charges upon three months' notice to the customer.

(2) IBM has the option of deciding whether systems engineering support (i.e., program services) will be performed on a centralized or a local basis or whether certain of these services, for given products, will be available only "subject to the availability of personnel."

(3) IBM can, with six months' notice to the customer, discontinue program support.

(4) IBM states that there is no obligation to achieve service results.

(5) IBM does not warrant that errors or program defects will be corrected.

Finally, after four and a half pages of fine print, there is an option reserved by IBM to modify the terms of the agreement on six months' notice (except for termination of the agreement or discontinuance of the license).

The third issue impacting independent software makers relates to account control. We have seen hardware techniques used in the past to keep plug-compatible peripheral manufacturers from encroaching on the IBM marketplace. Now, however, the focus is on the software lock-in, which potentially can be used to contain competitive forces, including the plug-compatible CPU manufacturers, the third-party maintenance organizations and the independent software product suppliers.

As long as the operating systems software and system control programs remain bundled or have the potential of becoming locked into protected microcode, IBM can set up effective barriers against likely competitors.

Simple Solution

With respect to the above three items, the solution is simple. IBM should be required to price each product or service it offers on a separate and independently supporting basis. Therefore, all software products should be available for purchase or rent. Maintenance should be separately priced.

Furthermore, specifications of hardware and software should be made available, upon announcement, to the independent industry suppliers so IBM holds no advantage that would preclude a response to impending changes by other suppliers.

Since almost all members of the independent software product industry supply the IBM marketplace, it is clear why these issues are so important to the health and continued growth of this sector.

It is for this reason that the independent software companies have seen fit to form an ad hoc industry committee, known as the Software Products Industry Advisory Council. One of the committee's selected tasks is to achieve appropriate relief from IBM in connec-

(Continued on In Depth/4)

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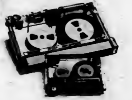

3M

(Continued from In Depth/3)

tion with the antitrust case currently being prosecuted by the Department of Justice.

Industry Factors

In an earlier section, financial profiles were presented for several members of the DP industry. Included was a representative of the software products sectur, Applied Data Research, Inc. (ADR), which showed an excellent performance in 1977, generating 18% gross profit on sales.

This compares favorably to other representatives of the overall industry, hardware manufacturers as well as suppliers of data services. Naturally, IBM's far better performance cannot be used as a guideline for measuring industry results.

Additional performance data for the software products sector comes from Management Science America, Inc., (MSA), which produced a gross income before taxes of 10.2% on more than $17 million in revenues in 1977 and 13.4% on more than $12 million in 1976.

We now have financial performance data from the prospectus of Cullinane Corp., which recently offered common share ownership to the public. Figure 1 shows the firm's progressive improvement in its income from operations.

All of this data seems to suggest that the software product industry is doing well. However, the industry does have severe problems which threaten its long-term growth capacity as well as its viability.

First of all, most of the companies are not doing as well as ADR, MSA and Cullinane. In fact, in the 1978 "Adapso Industry Report," it was found that the 1977 average gross profit before tax for 60 reporting software product companies was as shown in Figure 2.

The overall average is 11%. This suggests there may be an optimal size for software product companies in terms of maximizing the profitability rate. However, insufficient history is presently available to assert a conclusion.

Being a software product supplier does not in itself entitle a firm to any specific performance in operating income. However, recognizing the overwhelming risks associated with producing software as a result of front-end financial obligations, expensive marketing demands by users and the ever-present IBM position, I believe two necessary and significant conditions must be present to continue the motivation of these vendors:

- The potential for a 20% pretax profit.
- The potential for individual organizational growth which is in pace with the overall sector growth, currently expanding at more than 25% per annum.

Based on the criticalness of software and the substantial leverage users can obtain from purchased software products, it would seem the DP community would want to stimulate such growth and vitality in an industry that can so greatly affect its customers' productivity.

CULLINANE CORP.
FINANCIAL PERFORMANCE

Year*	Revenue (Millions)	Pretax Operating Income (Millions)	Income As Percentage Of Revenues (Percent)
1976	$3.4	$.47	14
1977	$5.3	$.85	16
1978	$8.9	$1.92	22

* Ending April

Figure 1

1977 AVERAGE PRETAX PROFIT
OF SOFTWARE PRODUCT VENDORS

Revenue Level	Pretax Income As Percent of Revenues
< $2 Million	11.2%
$2 Million-$10 Million	19.9%
> $10 Million	8.5%

Figure 2

The major operational issues with respect to the industry itself are those related to marketing and maintenance of the software. We have already seen the results of the life cycle analysis, which showed marketing costs run at 50% of the sales volume and maintenance at 10%. The amount spent for marketing is too high, and the amount available for maintenance is too low in order to sustain and build the industry. The consequences of such cost-to-price relationships could well be curtailed industry growth and undermaintained products.

The industry, which has existed for only a little over a decade, is, however, a victim of its own creation. At the outset, software product vendors fought an uphill battle to establish the principle that software had intrinsic value. Hence, the early producers, in order to persuade the user, adopted a number of practices which today are deleterious, including:

- The carryover of terms and conditions which were associated with hardware agreements.
- The acceptance of terms and conditions which substantially favor the buyer in order to lure him into a sale.

The adverse results of these two practices are now slowly being reversed as user attitudes mature and software product vendors increase their business perception. Nevertheless, users still often believe that purchased software should be cheap — a fraction of the hardware price and a fraction of what an in-house project might entail.

This logic is, of course, no more correct than allowing the price of an automobile to be set by the amount of metal used or as a fraction of the effort it would take to construct the vehicle on a custom basis.

Fallacies and Traps

The following are some of the fallacies and traps to which early suppliers of software succumbed, setting certain trends for the industry, which now needs redirection:

- *Product gestation period*. The gestation period for a product is a considerably long interval of time, running between five and 10 years from initial conception through prototype development, subsequent engineering and achieving reasonable market acceptance.
- *Manifold environments*. Because of the proliferation of various hardware/-operating systems environments, it has become necessary for software products to fulfill quite a number of needs hardly imagined at one time, at least for the IBM line.

These include the following: OS, DOS, CP, VM, TSS, MFT, MVT, VS, MVS, VSI, SVS, Hasp, ASP, JES2, JES3, CMS, TSO, CRJE, Call/OS, VSPC, ATS and ATMS.

- *Product dynamics*. If there is one factor that needs emphasis, it is that products are dynamic and constantly changing. During the pioneering days of software products, it was believed that once a program was created, it could sit on the shelf and be available for sale by simply replicating a master tape.

However, a package must be continuously maintained and enhanced. It must evolve! Users expect free upgrades and a continuous line of updates.

- *Demonstrations*. There is a belief that users are entitled to demonstrations without any obligation. This is simply not an inherent right.
- *Free trial*. Associated with the free demonstration idea is the free trial, which users have come to expect as part of the inducement-to-buy process. This has become so accepted that users were recently advised that "there should be no cost to the user if the package proves totally unacceptable after a reasonable period of time." Again, this is an unacceptable service if it is provided without fee.
- *Multisite discounts*. Why should software be discounted any more than hardware? The practice seems to stem from the apparent ease of tape replicability, as if this was the only associated cost. The same goes for both sale price and ongoing maintenance.
- *Lengthening life cycle*. Software is often a one-time sale, with the user expecting the product to be continuously available and operable, at least for the life time of his computer. The concept of life cycle has now been extended to successive machine generations as long as compatibility of the hardware exists. Under these circumstances, software can live almost forever.

The user cannot be blamed for this requirement with respect to proprietary software, since he demands this continued operability of his own application programs. However, the situation becomes a question of cost/-benefit as far as the software product vendor is concerned. The vendor must properly price the product, given the new economics of a much longer support period.

- *Warranties*. Unqualified and unlimited warranties of performance against specifications at the time of sale and continued operation against unknown future environments seem to be expected. As already pointed out, even IBM does not offer anything like this, and vendors simply cannot be placed in the position of having to accept business conditions that are not possible to fulfill at any reasonable price.
- *User groups*. Provision for and support of user groups is another benefit expected from product vendors. In some cases, the costs are partly absorbed by the participants.

Nevertheless, the activities of such organizations are subsidized and become part of the cost structure.

- *Protection*. Because of the lack of useful measures for protecting the proprietary rights of software product owners, the additional cost of securing and policing ownership protection becomes a necessary element of the business.
- *Product quality*. Because of the

(Continued on In Depth/6)

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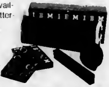

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(Continued from In Depth/4)

vendor/supplier relationship, software product quality must be substantially above that of software obtainable through other means, including in-house development and contract programming. Suppliers, for the most part, tend to produce a higher quality product, if only to minimize their own subsequent maintenance.

However, the user often wants to go beyond this and extract commitments of future support, protection from environmental changes and, sometimes, even remedies for potential damages.

- *Source code.* Providing source code to users creates several problems for the software vendor, including that of protecting proprietary interests. It also opens the door to user-generated changes which subsequently will affect the maintainability of the software.

The recitation of the above items was not made to suggest their elimination or curtailment. The list was simply provided to emphasize the point that software vendors have been asked to undertake enormous obligations as part of a product sale.

Every one of these line items ultimately translates into a cost and can be borne by no one other than the user.

An example

Let's cite an example. In the case of one communications-oriented software product, a check list of more than 500 line items was generated to measure the qualifications of the product and its vendor from the user's point of view.

Identified were detailed elements describing the available support, training, documentation, interfaces, control options, performance logging, file handling, security features, recovery processes, testing capability, vendor attributes and operational capacity.

This type of introspection is encouraged by the literature available in the DP community. For example, a May 1978 *Datamation* article admonished prospective software buyers to "check the reputation of the vendor, its financial and organizational strength and stability; transferability of software to other machines; training, documentation and warranty; maintenance and support; and costs, especially ongoing ones."

Particularly disconcerting is the implication that the transferability of software from one machine to another is an important criterion. Yet all of the above, and sometimes additional requirements, are singled out and heralded as conditions that must be satisfied more in the case of software than hardware.

Available Alternatives

Given the demands now placed upon them by customers and the realization that a 20% gross profit on sales is a legitimate aspiration, there are two alternatives available to software product vendors:

(1) Hold prices and shift five points of marketing costs to the maintenance category.

(2) Increase prices by an amount which will provide an additional 50% of cost coverage for maintenance

These variations of the earlier developed standard financial model are presented in Figure 3. In "Variation No. 1," the revenues remain the same, but there is a redistribution of five points of cost from marketing to maintenance.

In "Variation No. 2," prices are increased by 6.25% and the cost components are recomputed. In this case, maintenance (14.1% of 106.25) consumes 15% of revenues — or 50% more than in the standard model — and the 20% gross profit is retained.

SOFTWARE PRODUCT COMPANY COST ELEMENTS
(Percentage)

	MODEL	VARIATION No. 1	VARIATION No. 2
REVENUE	100	100	100
DEVELOPMENT	10	10	9.4
MAINTENANCE	10	15	14.1
MARKETING	50	45	47.1
G&A	10	10	9.4
TOTAL COST	80	80	80.0
GROSS PROFIT	20	20	20.0

Figure 3

It is doubtful that the first variation is achievable. The latter model seems reasonable in light of the benefits to be derived despite the overall pressures of decreasing hardware costs which may cause users to believe software prices should follow suit.

The truth of the matter is that hardware prices started high many years ago and are continually falling, whereas software prices started low and are (must be!) on the increase. It is interesting to note, for example, that in the case of the newly announced IBM 8100, the hardware monthly rental fee is essentially equal to the totally unbundled fee for a representative set of operating software.

But what is paramount for the user is that software price increases are not primarily directed at achieving more profits. Rather, they ensure the vendor the opportunity to increase his service and plow funds back into further development.

As a consequence, the overall business risk is reduced. The user can be assured that the vendor will be around for many years, continuing to make products that contain the cost explosion.

Of course, vendors' selling philosophy may drastically change in the near future and move toward usage pricing, much like the rental schemes associated with hardware. Users should be prepared for such an eventuality, recognizing once more the point made earlier that software stands as an equal partner to hardware.

The New Software Economics

During most of the last 25 years, hardware and systems software advances brought continual quantum jumps in architectural and performance improvements. Users sought to maintain pace, and the application software user's chase after the hardware began.

In the last two years, however, the user community has entered a new era of computer economics. The prolongation of the software life cycle is the result.

Two fundamental reasons for the change in the industry can be identified. They are attributable to technological and operational factors.

In both the hardware and systems software areas, we have arrived at a remarkably stable situation from the point of view of implementing applications. Hardware is available in a variety of forms and, while still being significantly improved, the categories of devices have stabilized.

It is therefore feasible to identify abstract classes of equipment and design systems so the ultimate software can operate in alternative environments.

For example, a generic terminal can be the input and/or output medium in a transaction-based order entry system. Only at runtime is it necessary to fix the mapping of this generic terminal onto a specific physical device. Similarly, this is the case in printing output when operating in a spooling mode.

There is also a significant stability in the systems software area. So many layers of protective systems and utility software now surround the application that the user can isolate his specific problem and have substantial flexibility in its implementation and ultimate maintenance.

Thus, not only can the user leave the problems of the basic executive and input/output control to the operating systems software, but applications can also be quite independent of such functions as:

- Teleprocessing monitors.
- Data base manager.
- Data dictionary.
- Transaction processor.
- Security control.
- Restart/recovery.

To achieve ultimate flexibility, one or both of the following tasks must still be done:

- The selection of a few universal implementation languages and the standardization of the interfaces (e.g., hooks) to the various systems software entities.
- The fixing of machine internals and the optimization of the hardware cost effectiveness ratio.

In such an environment, the focus can be on maximizing the application software, which becomes central to the various interests of the users.

Interestingly enough, we are practically there. Certain operational situations themselves are encouraging a change in the economics.

First, consider the question of a common language. Cobol is by far the overwhelming choice. In the earlier cited Guide annual survey, Cobol was clearly the front-running application development language when measured against Assembler, Fortran, PL/I, Basic, APL, RPG and Mark IV.

The operational success of IBM itself makes the second of the above goals realizable. Indeed, it is the vast amount of software for the very large IBM user community that has stimulated the plug-compatible CPU manufacturers to standardize production of computer mainframes based on the IBM 370 terminals.

And, to help matters, IBM has publicly stated that it expects to further its product line on an evolutionary, not revolutionary, philosophy.

Capitalizing on the Economic

Today's user therefore can stabilize his software investment over a substantial period of time. It is for this reason that users are advised to take the following steps in capitalizing on the new software economics:

- Adopt major software utilities offered by the manufacturer and independent software product vendors.
- Inventory the currently operating software and identify what is outmoded and/or requires undue maintenance.
- Replace the outmoded software by software products if available and if feasible.
- Survey current and expected needs and determine if solutions are available through purchasable software.
- For needs not satisfied by purchasable software, consider commissioning a software product from a vendor, either alone or in the company of other interested parties.
- In light of the above, reassess the organization and budget of the DP activity and determine if there is a restructuring option (for example, reduction in further software maintenance costs).

This advice may not seem profound, but this new view of software relative to hardware may be the single most beneficial step users can take to achieve more cost-effective computing. And the software product has a timely role in contributing to this new economics.

Users may have considered purchasing software years ago and concluded that the software product vendors were young, immature and not to be entrusted with their business, that the products looked primitive and unstable or that there were not many installations and therefore there was a question of acceptability. Or the user really did not know what he wanted.

But all that has changed. It is time for a second look, and the timing could not be better as users seek new approaches to riding the crest of the wave of the new software economics.

To quote Walter F. Bauer, president of Informatics, Inc., "If today 10% to 15% of the executed instructions represent those from purchased software, in the next 10 years that figure will undoubtedly rise to the 75% to 80% region."

Werner L. Frank is executive vice-president and a director of Informatics, Inc. The firm is an independent supplier of software products, professional services and information processing services.

Frank is a co-founder of Informatics and has been active in the management of the company for the past 17 years. During that time he also was president of Equimatics, Inc., a joint venture of Informatics and The Equitable Life Assurance Society of the U.S.

Frank has a B.S. in mathematics from Illinois Institute of Technology and an M.S. in mathematics from the University of Illinois. He has published more than 20 papers in numerical analysis and general DP subjects concerned with on-line systems and software development.

Correction

In Part 1 of "The New Software Economics" [CW, Jan. 8], the numbers in Column A of Figure 4 should have had three more zeros.

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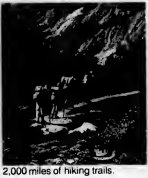
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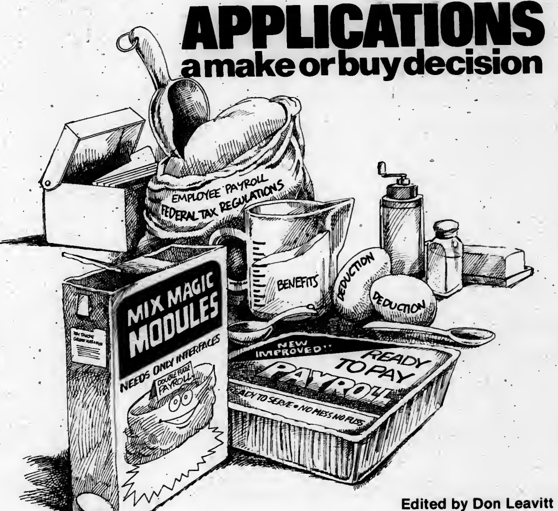

Edited by Don Leavitt
January 29, 1979

Look Beyond Price

Don't Neglect 'Side Issues' in Buying Package

By Phillip G. Elam
Special to CW

When the decision has been made to go outside the organization to acquire a software package, the prospective buyer can quickly become bogged down in a quagmire of what appear to be peripheral issues.

It is a relatively easy task to determine if a product is actually available to satisfy the buyer's DP requirement, since organizations like Datapro Research Corp. and Auerbach Publishers, Inc. publish excellent product summaries, However, there is an entire set of evaluative criteria beyond package price that the buyer should analyze.

Unfortunately, these "side issues" are either passed over or discounted as being of minor importance.

One of the most overlooked areas is organizational impact. What might appear to be a rather simple decision affecting only one application may well cause serious operating problems in interrelated areas. Since most organizations have already established some type of corporate data repository, there is no such entity as a stand-alone application. In fact, many DP executives no longer consider "applications" to be a valid concept.

After determining organizational impact, the next logical action is to identify those areas having the highest immediate payback. Not only will this aid the executive in his economic justification, but it will provide the buying organization with the optimum return on investment for its DP dollar. Of course, short-term gains should not be given preference over actions and strategies that aim toward the organization's long-range goals.

Once high-payback areas have been determined, the buyer will want to scrutinize available packages more closely. A considerable amount of time can be saved by simply eliminating alternatives that do not match the buying organization's current hardware/software configuration. In addition, any plans for future configuration modifications should be taken into account. Otherwise, the buyer may find he has technologically outgrown his solution in a short period of time.

And under no circumstances should the buyer acquire a package technically beyond the capabilities of his staff, unless serious thought has been given to developing the required expertise.

Thorough Investigation

In addition to technical considerations, the buyer should thoroughly investigate the package supplier, regardless of whether it is a hardware manufacturer or an independent software vendor. Since a long-term relationship is likely to develop, the buyer must make every attempt to verify the vendor's reputation for quality, service, support, response to problems and the ability to deliver on promises.

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Consideration in Package Choice

Integrative Ability Essential, Attainable

By Joseph R. Szmadzinski
Special to CW

The evaluation and selection of applications software packages can be an expensive and sizable task unless the proper evaluation criteria are defined and applied. Since vendors have permeated the marketplace with descriptions such as "interactive," "structured" and "modular," the assignment of qualifiers to those characteristics has become a necessity. One such descriptor that we have found a need to qualify is whether and to what degree a package is "integrative."

Whether software is being evaluated for the first-time user or an installed mainframer, the ability to integrate data flow across applications boundaries is essential. "Complete systems integration" has become attainable in today's environment of data base management and on-line information retrieval. Managerial requirements of correlation of data from various sources can be filled more easily through multiple applications systems interfaces

In addition, data that is needed to provide intersystem support from frequent updates is produced in a software environment where applications interface automatically. The type of interface and ease of implementing and operating it determine a software package's integrative capability.

Several Methods

The modular nature of programming and data storage has provided a consistent means for development and implementation, but a rather unclear way to achieve complete integration. But vendors can provide several methods for integration. In order of preference, they can offer:

- A Codasyl data base management system (DBMS).
- A data base handler that is tailored to the application.
- A set of clearly defined methods for achieving integration.

Taking a cue from benefits derived from a DBMS, the applications package's data elements can be organized and structured in a manner that minimizes or eliminates redundancy, which means that data storage and access costs can be minimized.

Outstanding Feature

The use of a DBMS also provides a standard for audit, data security and access limitation. Programs that normally would be provided to the applications packages to facilitate file reorganization and query techniques are available in the DBMS. Yet perhaps the most outstanding characteristic of a DBMS-oriented applications package is the "universal update" capability. This capability implies that one input transaction crosses applications systems boundaries to update all relative data.

Data Base Handlers

Many packages come equipped with their own data base handler. Generally, standard access techniques are available that can aid in creating selective data modules with relative ease. Examples of such data base handlers are bill-of-material processors and specialty disk-file handlers such as Forte and Direct. Several DBMS advantages are shared by this type of applications package.

Special data base handlers provide standard routines for security, backup and reorganization. Generally, these handlers also increase file-handling efficiency.

However, interfacing to other applications can be difficult. Special routines or language extensions must be applied to allow such interfaces, which usually means additional programming time and resources. In addition, consideration should be given to vendor commitment and support for such nonstandard functions.

The most common way of achieving

(Continued on Page S/12)

Ledger Package Puts End To Changeover Troubles

By Don Leavitt
CW Staff

CHICAGO — Don Simmons, DP manager at NII Metals, Inc., is interested in using packages whenever he can but he's not averse to getting involved in a conversion project if it seems to be worth the effort.

His rationale for going the package route when possible is very simple. The company has a small DP staff — two full-time programmers and one part-timer in addition to Simmons — and he doesn't like to staff up for any given project.

So he tries to keep aware of what's available. That way if a need arises, "we can find something that will give us a quick 'in' to what we want; we'll take it and get something going right away with the thought that we can tailor it later."

He said his crew had been burned too many times in building a system to specifications. Part way through the implementation, they would recognize that the front-end definition of the problem was bad and the entire effort had essentially been wasted.

Package Saves Time

By contrast, acquiring a package may save the company "three to six months" on the project. A package provides developed code with a de-

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On the Inside

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DBMS Helps Schools Keep Eye on Expenses

**By Nick Gangwish
And Tim Orwick**
Special to CW

GOLDEN, Colo. — All participants in the educational process spend a lot of time collecting, storing and retrieving information. The implementation of a total integrated information system that manages and reports this information should have a tremendous impact on the educational system.

This led the Jefferson County school district to use a data base management system (DBMS) along with applications programs developed by the district and packages from a software house.

The system supported by the Adabas DBMS from Software AG is comprised of five major data banks. They contain information on students, staff, instructional programs, the plant and its equipment and finances.

The fiscal system, by using dollars as a common denominator, links people, facilities and equipment.

The fiscal system, by using dollars as a common denominator, links together people, facilities and equipment. Major cost centers such as administration, transportation, instruction, maintenance and health are established.

These cost centers are then divided into accounts for programs, schools, subjects and so forth. This information model (see Figure 1) helps to provide a cost analysis of the major cost centers and programs. Educational programs and the number of participating students can be correlated with cost.

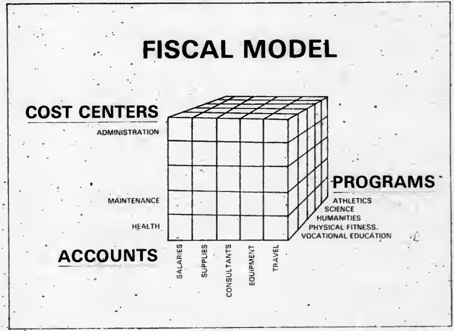

Figure 1

Software Implementation

The financial and administrative departments within the school district purchased generalized financial software from Management Science America, Inc. (MSA). They are being implemented system by system within the school district.

Specifically, the fund account system, the personnel payroll system, the supplies inventory control and purchasing system and, finally, the fixed assets system will all be affected by new developmental efforts and the implementation of the newly acquired software systems. Upon implementation of these systems, it is believed that the financial and administrative data bases for the school district will be established.

To make the financial systems operational in both the Adabas and on-line environments, the overall implementation plan by the school district must include interfaces between IBM's CICS, Adabas and the MSA systems. Furthermore, these interfaces must be designed so that changes in one of these components will not adversely affect the other two.

Because all three major components have been enhanced by the vendor, the interfaces must be designed so that future enhancements and major releases of operating systems, applications software and changes in teleprocessing monitors can be carried out with minimal disturbance to the overall system.

Fortunately, both Software AG and MSA take hardware vendor operating systems and teleprocessing monitors into account in designing and implementing enhancements to their software. However, some initial work was done by the school district to coordinate the efforts of MSA and Software AG to ensure compatibility as future enhancements are made to the applications software.

The coordination of Adabas and the applications software has been largely the result of the school district's efforts. The mechanism for the interface has been discussed in detail with members of the technical support staff at MSA and with the corresponding personnel at Software AG.

Ideally, the approach to application programming should be strictly structured, but because of the major education and reorientation effort required to implement this feature, a reduced version of a structured pattern has been put into use. This includes modularized I/O as a standard procedure for all application coding for major development within the school district.

A team composed of MSA, Software AG and school district personnel did the initial planning and continue to communicate as the project continues.

MSA programs access files through an I/O call to an externalized module. The I/O module receives the request for data or update and acts upon it.

This function does not necessarily mean that the externalized I/O convention has to be a DBMS. Externalized I/O tends to optimize the use of a variety of DBMS.

No reads or writes to any file are performed except in the I/O module. The concentration of file activity in this I/O module requires planning but, in turn, allows and ensures control of access. This is particularly useful when authorization for access is required.

Because of the number of programs comprising any of the MSA systems, a standardized set of subschemas — which can be equated to user views — has been established.

This reduces the number of sets or types of user views employed within any given system. At the same time, it minimizes the access of extraneous data items by programs that have no use for those items.

MSA applications expect standard Codasyl return codes in response requests. Adabas return codes, which are passed to an application program, must be translated into Codasyl return codes. This translation logic is coded into the MSA I/O module.

Software produced by the school district will also be interfaced with Adabas. The structure and protocol for the use of this data base is complete. However, operational use of such structures may have to be modified to existing situations and demands.

Nonetheless, the following guidelines have been established and used by several major system developments within the school district.

Reduced Version

Ideally, the approach to application programming should be strictly structured, but because of the major education and reorientation effort required to implement this feature; a reduced version of a structured pattern has been put into use. This includes modularized I/O as a standard procedure for all application coding for major development within the school district.

It does not necessarily externalize the I/O. The I/O will be isolated into a section of code within a given application program.

The data base definition must be reviewed and approved by the data base administrator for data redundancy, feasibility of elimination and for the orderly growth of the districtwide data base concept. Security provisions and requirements will be reviewed by the administrator to ensure a uniform source for interpretation of authorization.

Application programmers need not be concerned with the logistics of handling I/O functions within their programs. Writing out the Adamint macro request is the only demand on the application programmer.

Better Use of Time

More efficient use of the analyst/-programmers' time results, since their testing and debugging schedule is oriented strictly to applications logic, not I/O technical problems.

On the other hand, such a coordinated interface protects unauthorized access to the data base from external as well as internal personnel.

Districtwide data base integrity and logistics are the responsibility of the data base administrator, while system assurances are the responsibility of the analysts or the project leader. This separation of responsibilities ensures that specific projects and specific systems are implemented according to the feasibility document and the design specifications.

The overall districtwide plan requires data base deployment, and the logistics is thereby reviewed and controlled by a central source of responsibility.

Gangwish is with the Jefferson County Public Schools, and Orwick is employed by Management Science America, Inc.

First Buyers: Beware of Great Expectations

By Michael D. Gantt
Special to CW

Many users become frustrated with their first purchase of a major applications software package simply because they expect too much. While some may say this is the fault of the vendor's salesman, for the most part I would disagree.

But regardless of where the blame lies, the user should know what he can and can't expect.

This raises the question of why he wants to buy an applications software package in the first place. Ideally, it performs some function[s] the user organization would program itself if it had the programmers, time or money to spare. Any other motive for buying software should be suspect.

Assuming you have selected the proper applications package, you will save programmers, since yours will be free to work on other development projects; time, since the development time has already taken place in the vendor's shop; and money, since as a customer you pay only your portion of the development cost rather than the whole thing.

The amount of savings in each of these areas will depend on the particular deal you strike with the vendor. It is conceivable that a deal could be arranged with a particular product such that none of these three things are saved (if you feel capable of this, perhaps you should be reading "Position Announcements" rather than this article), but the chances are extremely remote.

Those, then, are the benefits you should expect. You may very well receive other benefits when you buy your applications software, but if you go in expecting more, you're just asking for heartache (and probably intermittent heartburn as well).

Examining Expectations

Many first-time purchasers have had specific expectations that did not materialize. So that you are forewarned, here's what not to expect:

1) *Don't expect the selection process to be a light chore.* Finding a "good" software package is relatively easy. Finding the "right" package is hard, grueling, work. Many users look past the selection process to the implementation phase, when they can "really get to work."

This is backwards. All the heavy planning should be done before the package is chosen. Only in this way can you determine that you are choosing the "right" package (the one that fills most of your needs). If a detailed "needs analysis" is going to be done, it should be done during the selection phase, instead of during the implementation phase (when it's usually done).

2) *Don't expect to receive as much attention from the vendor after the sale as before.* It is only natural to expect this, and yet many users develop "postpartum blues" after the painful trauma of separation from the vendor salesman who spent every waking hour caring for their every need. Once you've purchased the package, it's primarily your responsibility to see that schedules are kept.

Don't misunderstand; I'm not implying that software vendors will let you down. On the contrary, must of them care very much whether you have a successful operation. It's just that during the sales phase, the ball is in their court. Any slipups hurt them more than you.

During the installation phase, the situation is reversed. Any slipups hurt you more than them. Just remember that, and you won't be disillusioned if the wine, laughter and song all seem to evaporate a week after you've signed the contract.

3) *Dont' expect the package to handle everything just the way you want.* Most users will say they don't expect this, but most users are only paying lip service.

Somehow we get the impression that because a vendor is involved, the package should handle anything and everything in the most efficient way (whatever that is). We want it to handle every function requested by the end users (even though our old in-house systems never came close). We must be reasonable. Software vendors are just like everybody else. Why should we expect their systems to meet some false standard of excellence that our own never would? Expect quality but not perfection.

4) *Don't expect to meet your initial implementation schedule.* Managers get so tense about timetables. It's OK to expect the vendor to meet his schedule, and it's OK to want your own people to meet their part of the schedule. But don't get overly concerned with predicting all your due dates for a major installation two years ahead. Chances are you will never meet your initial implementation schedule. After all, planning and implementing a major applications software package on schedule requires skill. And to develop any skill requires practice, right? And how much practice have you have had implementing major applications software packages lately?

5) *Don't expect anything from the vendor you haven't been told you would get.* So many misunderstandings develop between user and vendor because someone assumed someone else was going to do something.

Don't assume anything! A good vendor will be happy to answer any questions you have about the system you are contemplating and happier still to

(Continued on Page 5/10)

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Not Just a DP Project

User Involvement in Installation Spells Success

Special to CW

RICHMOND, Va. — The active role First & Merchants Corp. (F&M) personnel played in the installation of a software package has contributed greatly to the success of that package at the bank holding company.

F&M area representatives offered valuable input into the project from selection through implementation of University Computer Co.'s (UCC) Customer Information File (CIF).

The software is being implemented on a regional basis. So far one region, containing 345,228 customers and 324,292 accounts, has been converted.

Such a massive project requires individuals with special talents and expertise who can communicate effectively with each other on a common basis. This common ground was provided by UCC in a preinstallation education session and in-conversion and on-line workshops.

As a result, the information needs of the users were defined and understood by DP personnel. Users, in turn, understood the method used to fulfill those needs, or perhaps more important, the DP impact of specific information needs. It was clear a project with the organizational impact of CIF could not be solely a DP project without an understanding of the DP environment by the user.

According to Tom Dreelin, retail banking officer at F&M, "By involving representatives from various areas in an in-depth study of the bank's future needs, we could foresee that the CIF could provide the vehicle that would promote enhancements to existing services and the development of new services which up to now have been both time- and cost-prohibitive."

Unique Approach

Early in the development of the implementation plan, it was decided the CIF would be developed by an on-line conversion method applied at different times to F&M's various statewide regions. That is in contrast with the more traditional approach of converting an entire application — checking, installment loans and the like — for one bank at a time and "scrubbing" (correcting the converted file) in a batch processing environment before using the system on-line.

In the regional on-line conversion method, all the applications for a particular geographical region are processed with normal conversion programs and loaded directly to an on-line file. The conversion reports are then reviewed, and all "scrubbing" is done with standard on-line maintenance functions.

There were several reasons why F&M decided to take that approach in implementing CIF:

- CIF-related services, such as combined statements and debit cards, can be implemented in a particular region in a shorter period of time.
- "Scrubbing" on-line eliminates extensive coding, keypunching and batch processing of corrections.

In the on-line mode, corrections are keyed from notes made directly on the reports. The conversion clerk can visually review what has been keyed during the procedure.

- The CIF system provides post on-line processing and produces reports that provide a more effective method of reviewing the work, than the batch "scrubbing" reports.
- The experience gained using the on-line system while converting applications has proved to be invaluable in developing CIF maintenance and use procedures after a region is converted.
- Since F&M uses CIF to feed name and address change transactions to the various applications on the system, converting all applications in a region will allow that region to be consistent in the handling of those transactions. This causes less confusion for the branch personnel.
- Any research to correct ambiguities during conversion can be handled at one time in a region. It will not be necessary to ask a question about checking, for example, one month and then a year later ask about another application.

"What we learned from one region gives an excellent opportunity to make the conversions of other regions easier and the final product better. Like everyone working with a new system, we've made mistakes, but we've learned a lot. I am confident this conversion method was one of the cornerstones of our success to date," Jim Basl, CIF manager, said.

The branches in the region that has already converted to CIF are using CIF for inquiry. All name and address change transactions in the various applications converted to CIF are handled according to the maintenance procedures.

An average of 200 phone inquiries a day is being handled in a central area and approximately 300 to 350 maintenance input forms are received daily.

F&M started its conversion in October 1977, about six months after CIF was purchased. It began using the system for inquiry and maintenance in June 1978.

During the installation and conversion period, all user areas were involved in a review of the system and

(Continued on Page S/22)

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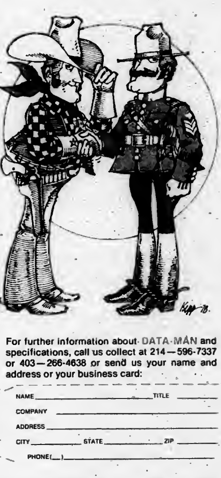

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With One Full-Time Programmer

Package Helps Bank Meet Conversion Plans

By Warner Turner
Special to CW

JACKSON, Tenn. — The National Bank of Commerce here is a $100 million bank with five branches. Last year we formed a multiple-bank holding company and purchased an additional bank with two more branches in Gibson County, Tenn. Our data center services all nine branches.

We have been able to meet the challenge of business expansion under a new computer system largely through our financial software.

When we decided to switch from a Burroughs B500 to an IBM 370/115 two years ago, we had only one full-time programmer and a tight conversion schedule. Applying financial software from Weiland Computer Group, Inc., we successfully made the conversion, complete with in-house training for 120 employees, within eight months. Best of all, we did it with no interruption of bank services.

Before beginning the actual search for specific software packages, we made a list of features we needed in a system. The most important factor to us was to have a totally integrated system, one designed to perform all banking functions together within a single framework. We were looking for a system that shared a common data base and one that had total monetary control with built-in audit trails. We wanted to be certain all the name, address and file maintenance came in at one central point, but worked on all records involved.

> *'Before beginning the actual search for specific software packages, we made a list of features we needed in a system. The most important factor to us was to have a totally integrated system, one designed to perform all banking functions together within a single framework.'*

The system had to be state of the art, with such features as built-in federal and state reporting formats, back-date transaction capability including recalculation of interest on those transactions and history retention for a full year. And, finally, we wanted a system that would give us a full-descriptive statement on demand deposits, including check serial number sequencing, and one that could interface with the Automated Clearing House for intrabank information tape transfers.

IBM Recommendations

To prepare for meeting those needs, as well as the new computer, we called our IBM sales rep and asked for his software recommendations. To our surprise, he gave us a list of six independent software vendors who market banking applications packages.

We contacted each vendor, explained our requirements and evaluated the products through use of literature, documentation and, in some cases, sales presentations. In the end, we chose the Weiland Banking System.

We met Weiland research and development people at corporate headquarters in Oak Brook, Ill., and observed their full banking system in action at one of the two data centers Weiland operates as service bureaus for more than 30 commercial banks. We were impressed with Weiland's use of its own software products and, in the end, this was an important deciding factor in our selection.

The other five packages we evaluated were very similar to one another. Unlike the Weiland Banking System, none of the others were integrated systems. There was no way demand deposit transactions related to the savings system or the commercial loan system.

Vendor documentation was generally poor, but Weiland's is clear and concise, especially in line code specifying what each line of code does.

For product support, Weiland offered more services. With only one full-time programmer, we knew we'd need all the vendor support we could get. Of course, the important point is that after the sale, Weiland came through with the support it had promised. In fact, I'm convinced that had it not been for such support, we could never have changed systems in only eight months with a single programmer.

So, after four months of careful evaluation, we bought all the Weiland batch systems in preparation for the arrival of our 370. The conversion itself began a month after the machine arrived, when we converted our savings, payroll and funds transfer systems. Three months later, we converted to the Weiland Installment Loan System, and five months after that, converted demand deposits, commercial loans and mortgage loans.

Our biggest problem during the conversion was not putting up the systems themselves, but retraining bank personnel in the systems' use. In-house training took place while the eight-month conversion was under way.

During all of these changes, we were able to do our work without customers being aware of any change. Of course, when it came time to send out monthly statements, we had to educate customers to the new forms. We mailed samples of our new forms for two months prior to the final conversion.

As for bank employees, despite mandatory four- and five-hour training sessions, about 90% prefer the Weiland Banking System because they can use it to get more information than ever before and that makes their jobs easier.

While we do not have on-line capabilities now, we expect to be on-line by the third quarter of 1979 and, by 1980, hope to have terminals at all teller stations.

Turner is vice-president and cashier at the National Bank of Commerce, Jackson, Tenn.

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Firm Revs Up System to Cope With Production

MADISON, Wis. — Computer-controlled production planning, implemented to improve inventory turnaround and control, has brought tremendous savings to an office products manufacturer here.

According to Pat O'Brien, operations manager for the W. T. Rogers Co., "It has more than justified the cost of the DP equipment investment. Lack of an efficient production control system threatened our growth. With manual production control methods, we either tied up capital in excessive inventory or lost sales through back orders."

Back orders are a particular thorn in Rogers' side. The company sells directly to 12,000 dealers and jobbers nationwide, and back orders can mean customers will turn to another manufacturer. Rogers' growth is dependent on its ability to maintain adequate, but not excessive, stocks in its own warehouses.

"Our rapid growth — sales volume in 1977 was 10 times greater than in 1967 — outstripped our ability to manually maintain and control an inventory of the most efficient product mix," O'Brien explained. "It was obvious we could only increase inventory turnover and reduce back orders by using DP in our production planning."

Strength Creates Problem

Ironically, the problem stems from one of Rogers' strengths: Only 15 machines and workstations are used to turn out hundreds of varied products. That means allocation of each machine's time must be carefully scheduled to take into account demand for a product, inventory on hand and production machine changeover time.

"Each minute an injection molding machine is down for a mold change represents lost production time," O'Brien noted. "Even so, it is not practical to run a year's supply of a product at one time. The savings would be quickly eaten up by inventory and storage costs."

Computerized production scheduling was adopted in 1977 with the upgrading of Rogers' existing Burroughs Corp. B1712 CPU, which had handled general ledger, payroll and other accounting functions.

"What made this practical for us was that Burroughs had available a production control software package (PCS-I) that could be run on our relatively small computer. We were able to avoid a heavy investment in new DP equipment by expanding the system we already had," O'Brien said.

Rogers was able to run several modules of PCS-I on the existing system using a disk cartridge drive. When early results looked promising, the processor was upgraded to the Burroughs B1717 level. A disk pack drive replaced the cartridge drive as the production control functions were added and greater speed and storage were required. The system now has 128K bytes of main memory, with an additional 32K bytes to be installed later.

Six Basic Modules

"Six basic modules make up the heart of PCS-I," O'Brien said. "We started with the bill of materials, stock status, costing and work center and routing modules. We added material requirements planning and order release later. Those give us complete control over plant operations."

PCS-I allows tracing by product or by work center all materials used in the production of Rogers' line. Altogether, approximately 3,000 items are involved. Costs of each item, component or subcomponent can be calculated and the status of all stock can be controlled with a greater degree of accuracy than was possible before.

How does this increased control benefit the company? O'Brien said the savings stack up in dozens of areas.

"Before, we kept track of operations through inventory sheets and time cards, but as we moved from using 40,000 pounds of plastic a month to using that much in a week, our materials requirements planning became more of an estimate than anything else. Usage of some raw materials, such as wire, could not be accurately predicted at all."

The amount of material consumed for each product now can be calculated with great accuracy, according to O'Brien. When combined with planned scheduling, Rogers people know the time frames and the amounts of raw materials needed for months in the future.

"This accurate materials cost analysis can also be used with our detailed job cost and work center data to give us much more complete and timely costing of any of our products," Robert Barlow, administrative assistant, pointed out.

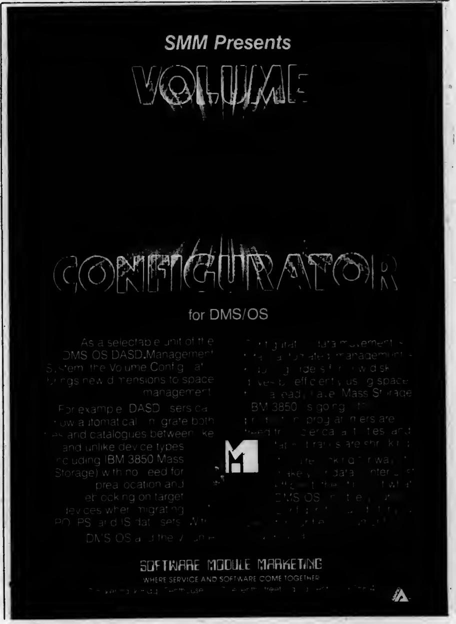
Each work center is given a rate that includes wages and a proportional share of overhead. It is therefore possible to produce cost figures for individual components as well as for an entire product.

"This is useful in several ways," Barlow said. "We have numerous products that use the same component. If our supplier raises the price of that component or the raw materials used to produce it, we can enter that increase once and the system will apply it to the whole relevant product line.

"Furthermore, the timely availability of that data as it applies to our product costs facilitates sound management decisions in the areas of purchasing, production, pricing and marketing."

Rogers' national sales staff uses the costing report to ensure accurate

(Continued on Page S/23)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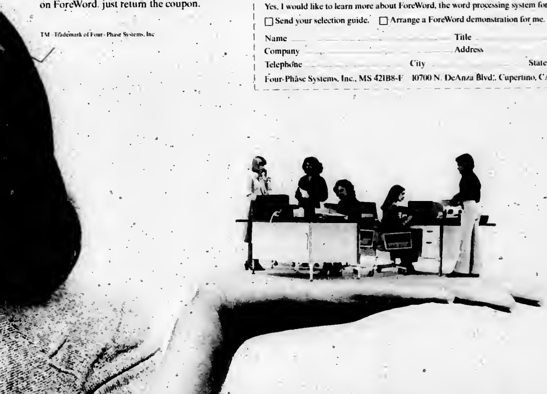

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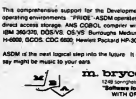

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Attention to 'Side Issues' Vital in Choosing Package

(Continued from Page S/2)

Many users of any given package will openly concede that success or failure often depends on the vendor's level of involvement.

Obviously, the buyer should find out how maoy other organizations are using the package. A common approach is to ask the vendor to supply this information as well as the names of contacts in organizations actually using the product.

In some situations, it may be wise to ask for vendor reference accounts in the same industry or with similar hardware/software configurations. A phone call to the contact may provide sufficient answers, or some buyers may prefer to actually visit the using organization. But in either case, the buyer should follow up. And the buyer would be wise to contact organizations that have used and discarded the package.

One method of determining the product's longevity is to evaluate the vendor's commitment to it. For example, has the vendor kept pace with technological advances in areas such as hardware, operating systems and access methods? And when there are multiple versions of the package, does true upward compatibility exist?

When conversions are required, does the vendor provide tools or guidance to assist the buyer? Is the vendor committed to a strategy that periodically enhances the product in terms of efficient utilization of hardware resources, throughput, options for advanced levels of operation and the like? And, probably most important, has the vendor effectively addressed the product's "ease-of-use" factor by incorporating techniques that will improve programmer productivity?

A great deal of emphasis should be placed on how the vendor views the concept of product support. For example, the buyer should evaluate the level of documentation that accompanies the package. Does it contain clear, concise, meaningful examples on how to use the package in a production environment or was it merely designed to be attractive? And training for management, technicians and users should be thoroughly defined.

The level of technical expertise exhibited by the vendor's support personnel will, of course, be a critical factor in the success or failure of the package's use. Without this level of intense commitment on part of the vendor, the user will quickly find himself all alone trying to install a package he really does not understand.

Trend Evaluation

All responsible suppliers of software packages continually evaluate trends in technology for a number of important reasons. First, from a proprietary standpoint, the vendor must ensure that his product remains competitive; otherwise, he will experience serious losses in market share.

Second, the vendor must ensure that his customer base can take advantage of new technological developments when applicable.

And last, the vendor must ensure that technology does not disrupt progress that has been made by the customer's use of the product. Is the vendor willing to share this insight with the prospective buyer? Obviously, information of this nature will help the prospective buyer accurately determine if his organization's direction and the vendor's strategy for future product development are in harmony.

In order to fully optimize the organization's investment, the buyer should thoroughly investigate the vendor's purchase/lease options. The buyer should be aware that vendors who do "purchase-only" business may not be around tomorrow to service what they sell today.

And he might also want to be leery of ao "all-or-nothing" package policy. That is, must the buyer take the entire product or will the vendor permit him to install only what he needs to satisfy current needs with the option of acquiring "add-ons" later?

The buyer might also want to investigate the vendor's position on communication between users of the package. Does the vendor encourage the interchange of ideas and user experiences? Are customer newsletters made available on a regular basis?

Are user meetings held? And when they are held, are they merely sales pitches or do they make information available that will actually help the user in his application of the package?

Finally, the buyer should understand that the acquisition of a software package is a business decision as well as a technical one. Under no circumstances should the executive completely relegate his responsibility to technical support personnel.

DPers tend to evaluate solely on technology. And while this is important, it will not necessarily coincide with the organization's long-range business strategies. When a package is judged strictly on "bells and whistles," the organization usually finds the solution that is adopted completely overlooks the original DP problem that prompted acquisition of the package.

Elam is manager of information system architecture at Cincom Systems, Inc., where he was previously head of the company's education department.

Users Shouldn't Expect So Much

(Continued from Page S/4)

avoid those misunderstandings.

Those, then, are the five major expectations you should avoid. That doesn't mean that they won't ever be fulfilled. It just means if they are, it will be a pleasant surprise and one for which you can thank God (and yoor vendor). The applications software vendors have done so much for us in the last 10 years that we sometimes create our own problems by expecting even more.

Gantt is president of Insurance Research Corp., a Columbia, S.C.-based education/research/publishing organization that conducts seminars and other business throughout the U.S. Holder of the Certificate in Data Processing, he previously had overall management responsibility for more than 200 managers, systems analysts, programmers, operators and others.

University Becomes 'Student' in Package Quest

**By James W. Spencer
And Leighton Jones**
Special to CW

TOLEDO, Ohio — Several months ago, the University of Toledo set out to replace an outdated payroll system. Our initial feasibility study resulted in the decision to purchase a package. Although our procedure for selecting a vendor was not unique, we gained valuable information through it.

We invited 10 companies to submit descriptions of their packages. Of these 10, three were invited to give formal presentations of their systems. We were not sure any of them could meet our requirements and were surprised that all three seemed satisfactory.

Like many prospective package buyers, we asked the three vendurs to provide lists of clients who had experience with their products. In preparing to contact these clients by phone, we designed a questionnaire we thought would help us in our evaluation.

We wanted to find out more about the quality and quantity of the vendor's and support, the willingness of the vendor to go beyond the actual terms of the contract, client involvement in the project, the end users' satisfaction and the system's efficiency.

Some Unfavorable Responses

We had assumed that the clients whose names were supplied to us by the vendurs would all give favorable responses, but such was not the case.

We now see three possible reasons why clients with poorer references might be on a vendor's reference list. First, the vendor may have been out of touch with his client and may not have recognized existing problems.

Second, the vendor may have gambled that no one would check the list. This theory was substantiated by several of the clients we contacted, who said they had never called clients when they were selecting a vendor.

Our third hypothesis is that the individuals we questioned were not the same people the vendor thought we would be contacting. In most cases, we called the director of the computer center, who then put us in contact with a systems analyst or team leader on the project. Their technical experience with the system or with the vendor may have differed greatly from that of the director or some other administrator.

In any case, the clients were generally very well pleased with the vendor they were using and said they would probably choose the same one again. Some of the dissatisfied institutions had circumstances that would explain their problems. For example, one department had had a complete staff turnover, and the senior programmer had only been there for nine months. In another case, the software selected was written in Cobol, but the DP staff consisted of PL/1 programmers.

Common Characteristics

These contacts with clients yielded only minimal information that would help us in selecting a specific package or vendor. But they did prove valuable in another way: we found that those clients who had successful experiences with vendors shared certain operating characteristics.

1) Each installation had a predetermined critical path. These paths were certainly different from one place to the next, but whatever the path, the installation felt it was important that each item be addressed thuroughly before going on to the next.

2) Whenever possible, the base system was installed as developed and tested by the vendor before user modifications were made. After using the base system and seeing the reports, the users then made the necessary modifications. This made it easier to detect errors in the system and identify points of responsibility.

3) The user team was involved as much as possible in the effort — from the selection of the vendor through the final implementation of the system.

The more the user became involved in the project, the more his interests became vested. He did not consider the project an imposition of the computer center upon him.

4) The computer operations staff was involved from the outset, because often the decisions that were made directly affected its activity. In one case, the vendor emphasized a preparation run prior to actual payroll processing. The payroll office was very enthusiastic about this feature. But upon implementation and during parallel testing, computer operations found it couldn't feasibly run the prepayroll register on a weekly pay cycle.

5) Each installation knew exactly what it was buying. It identified the amount of support it would receive from the vendor and listed the actual programs and documentation that would be supplied.

Each client let the vendor know what was expected. Each asked such questions as: Do we expect the vendor to compile and test programs? Do we expect him to pay for his own computer time? Will we reimburse the vendor for expenses only if it supplies receipts?

6) Third-party agreements were avoided whenever possible so that the buyer was not expected to supply services that would create difficulties.

This is just a brief list of some of the major considerations. Although the results were different from what we were expecting, the exercise was well worth the time and effort on our part.

Spencer is director and Jones is a systems analyst of Computer Services at the University of Toledo in Ohio. ●

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Turnkey Saves Day for Systemless Company

NEW YORK – Picture this: You are a successful distributor with some 10,000 accounts and 5,000 inventory items. You are grossing $8 million a year. Suddenly you have no system – manual or automated – to run your business.

A businessman's nightmare? Perhaps, but it actually happened to Criterion Consolidated Corp., an importer of costume jewelry here.

According to Arthur Damast, treasurer of Criterion, the firm survived because the crisis lasted less than a month, thanks to the immediate availability of a turnkey hardware/software system and a cooperative vendor.

The rare circumstance of an ongoing business being without any business operations system occurred when Criterion split off from a larger corporation called Criterion/Commodore. As Criterion moved out, it left behind a card-driven IBM 360 system.

Disagreed About Structure

As Damast explained it, the dissolution took place for a variety of reasons, one of which was disagreement among the principals about how to structure a system that was to replace the 360.

Criterion/Commodore was in the process of negotiating a contract with STC Systems, Inc. (STC/S) for an Ultimacc small business system when the principals decided in March 1977 to dissolve the parent company.

While it was in the process of moving into its own building in the borough of Queens, Criterion signed a contract with STC/S for an Ultimacc configured with the vendor's Standard Distributor System SDS/2 software.

In less than a month, the 10,000 customer names and addresses and 5,000 inventory items were built up into an SDS/2 master file by Criterion people with help frum STC/S personnel. By the beginning of May, the system – tailored to the user's needs – had been demonstrated to Criterion management at STC/S offices in Maywood, N.J., and acquisition was approved.

While waiting for the system to be installed at its location, Criterion used photocopies of purchase orders to create shipping instructions for its warehouse staff, Damast continued. That didn't last long – Criterion was very lucky to be able to get the hardware configuration it wanted "almost immediately," according to an STC/S spokesman.

Three days after the turnkey's installation, Criterion's staff was trained and the system became operational.

Within a month, the users had finished all backlogged paperwork, the treasurer reported. Now the system is used on a regular production basis for billing, inventory control, sales reports and analyses, accounts receivable and payable, and payroll.

"We accomplished the corporate separation without running the risk of serious business losses partly because the people of STC/S were so cooperative," Damast said. "We got exactly what we wanted in the system, and we got it in record time."

Integrative Ability Key

(Continued from Page S/2)

integration in software packages is for the vendor to supply one or more transaction postings that may be applied to other applications systems. Examples include punched output files, summary posting disk files or an audit tape of a day's transactions. Any interfaces must be completely programmed in that case.

Absolute Necessities

If packages possess no obvious interface capability, the costs and time involved in implementation are greater than in packages that use data base techniques.

Since this situation is nonetheless very prevalent, good supporting documentation and significant software standardization and structure are absolute necessities.

Szmadzinski is a supervisor on the national management consulting staff of Ernst & Ernst in Cleveland.

"Hyster Company red
to less than half

Hyster Company uses 30,000 standard part numbers and 70,000 bill-of-material records in the manufacturing of lift trucks, straddle carriers, and towing winches at their Portland, Oregon plant: Yet, inventory has been reduced by over 85%, compared to what it could have been as sales have increased. Lead time from the plant has been cut by 63%.

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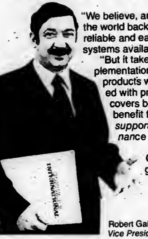

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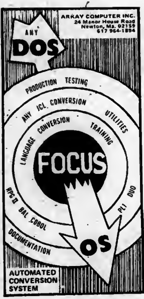

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AUTOMATED CONVERSION SYSTEM

User Detailed Eight Criteria

System Success Credited to Selection Process

By M. Philip Aumack
Special to CW

ATLANTIC CITY, N.J. — At Spencer Gifts, Inc., we have a well-ordered DP center based on an IBM 370/145 running under DOS. But by last April, we realized the ledger system we had built in-house wasn't as good as it should be.

Our ledger system was only used for divisional and state general ledger reporting.

Any additional reporting was manually created.

Beyond that, it was evident other changes had to be made. Because our situation was not unique, it may be useful to review how we moved from an awareness of our shortcomings to a solution with which we are happy.

The changes we needed finally took the shape of eight criteria we set up for a general ledger/budget system. We saw, first of all, a need for a combined, effective, functional general ledger and budgeting system able to capture data from both the current and prior years. An ability to process multicorporations and to report consolidated information was also essential, we thought.

The system needed excellent edit control procedures for subsystem and journal entry processing.

We needed a flexible account structure which could be used not only to identify a chart of accounts, but to link those accounts in reports. Also considered a necessity was an ability to model new departments by moving accounts from an existing department to a proposed one.

The ability to install a variable budget with extended forecasting was our fourth criterion. File space for budget revisions and for three- to five-year projections was of fundamental importance to us.

The capability to generate financial reports ranging from departmental comparisons to consolidated statements with currency conversions, without dependency on DP personnel, was our next goal.

The capacity for financial modeling and long-range planning was another must. The ability to deal with executives' "what if" questions and simulations were other strong considerations.

In addition to all those application-oriented technical concerns, implementation support was deemed critical. Included in our support parameters, instruction for the report writers was of particular interest to me; partially because of this concern, my initial implementation was seriously delayed.

The final but by no means least important criterion was cost. That meant *all* costs — initial development or acquisition, maintenance and enhancement work and any front-end fixes.

Inside or Outside Job?

As far as we were concerned, the system could be brought in from outside or developed in-house, so I asked our DP staff to review our needs. They said the implementation would most likely take more than a year and a half and require at least two programmers and an analyst, after which a report writer would still be needed to fulfill the one-shot and other nonstandard report requirements.

That assessment, while possibly valid, seemed to involve too long a time frame and too great a cost, so we began to look to software vendors. My committee, which included representatives from both the financial and DP areas, went first to the Datapro Research, Inc. directory.

The approximately 60 available systems was narrowed to 11. Upon additional investigation, we found six of the systems actually possessed the attributes we felt were required.

The next phase of our evaluation involved comprehensive presentations by each of those six vendors. I insisted that each committee member attend all presentations; this phase of the process cannot be stressed enough, because it is here that the "hows" behind the various systems are differentiated.

Working only with our checklist of required criteria, several of the packages appeared very similar. The presentations — and question-and-answer periods after them — let us understand the methodology behind the products.

Here we could evaluate how "user-oriented" the systems really were, and we soon discovered it was not neces[illegible]ly the largest vendors that really met or were even interested in all of

(Continued on Page S/23)

uced parts shortages of one per cent!"

"Getting a real-world picture of what is happening is key to solving the manufacturing resource planning puzzle. Software International's Net Change MRP system was a key piece that has given Hyster Company exactly what they needed for their material and capacity needs. By implementing a packaged software system, Hyster Company got the flexibility to meet their own unique requirements."

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Vendor's School Strives for Software Success

By Christine Machen
Special to CW

There are several important areas to consider when evaluating an application software package. A critical one that impacts how effectively a system is installed and implemented is the vendor's approach to user training.

While all vendors offer some form of training, it is important that the software purchaser thoroughly investigate the specific program each vendor provides.

At McCormack & Dodge Corp., the approach we have taken to training our customers has had a significant effect on eliminating problems during implementation.

It became apparent to us that without a comprehensive course of training, our customers would not be able to utilize our systems to their best advantage. As a result, we developed a formalized school program to give our customers hands-on experience with our systems before installation and implementation.

Monthly Basis

Training schools are offered on a monthly basis or as needed for each of our software products. Lasting three to five days, the schools are available to new customers as well as current users who participate in our annual maintenance program.

We developed the schools to duplicate as closely as possible what a new user would experience during an actual implementation. Realistic course problems are designed to utilize the major features of the system.

Course data is input to our computer and thoroughly analyzed in class, giving students maximum exposure to the system and its applications. By the time the school is over, each student has successfully completed a practice implementation. This results in a smoother and faster implementation at the user's own site.

The user obtains many advantages from this type of comprehensive training program. One important benefit is that the personnel teaching the schools are the same individuals the customer will rely on for continual technical support.

School instructors become familiar with each user's unique application requirements during the course of the school. This knowledge allows them to provide better overall product support, as well as to offer advice on the most effective way to use the software package to meet the customer's unique accounting requirements.

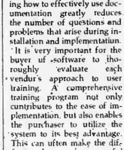
A formalized school program is not only an effective means of training new users, but also of retraining users when new versions of earlier systems are released. Of great importance to the user is that training is consistent.

With formal training courses, customers are assured that all of their personnel, regardless of turnover, can receive the same quality of instruction.

Another important benefit is that the user is familiarized with the system's documentation during the school. Learning how to effectively use documentation greatly reduces the number of questions and problems that arise during installation and implementation.

It is very important for the buyer of software to thoroughly evaluate each vendor's approach to user training. A comprehensive training program not only contributes to the ease of implementation, but also enables the purchaser to utilize the system to its best advantage. This can often make the difference between a successful and an unsuccessful installation.

Machen is a marketing assistant at McCormack & Dodge.



'So, What Are These Outer Limits of the Unknown Universe?'

"...we converted to the Fortex fixed asset system in 12 days... and met our standard closing schedule with no lost time!"

Leilani Nye Johnson
Manager—Corporate Property Accounting
Memorex Corporation
Santa Clara, California

So said Miss Johnson following the successful installation of the Fortex Property Information and Management System. And she credits this speedy conversion to "the combined dedication and knowledge of the vendor and user..." And dedication and knowledge are paramount to the Fortex business philosophy.

With every software package, we offer expert technical support personnel, who have program experience *and* functional know-how. They are expert in not only system capability, but in documentation as well. Miss Johnson termed the PIMS systems documentation "...very complete".

Fortex systems are truly modular, and therefore easily maintained. We are constantly refining and enhancing our programs, and you can be assured that your Fortex software product will be kept modern and efficient by the addition of these updates as provided in our standard maintenance agreement.

Whether you require a software package for fixed assets, credit, or accounts receivable, Fortex has a proven system for you. Our systems are running now in many top corporations; systems that are batch or on-line; systems that are providing requested functional data in a format and time frame desired.

We believe a system should give you the information you want, in the form you find most useful, at the time you need it. And that's why we designed our systems with true modularity and maintainability. We can tailor them to your functional requirements.

So, when your priorities dictate a new software package, call Fortex. We can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability. Fortex Data Corporation, 10 S. Riverside Plaza, Chicago, IL 60606. Telephone: 312/454-1650.

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User Learns Through Experience

Generalized System Won't Meet Special Needs

**By Martin Feuerman
And Amiram Sheffet**
Special to CW

NEWARK, N.J. — At the College of Medicine and Dentistry of New Jersey, we recently had the task of solving a linear programming problem involving 264 variables and 165 constraints. In particular, we wanted to optimally assign patients to drug-abuse treatment and rehabilitation programs, subject to constraints on various resources.

Our campus utilizes a high-speed card reader and printer linked to a pair of IBM 370s located at Rutgers University's Hill Center for Mathematical Sciences in New Brunswick. The 370s are maintained by the New Jersey Educational Computer Network, which supplies services to member colleges in the state.

We had the choice of using one of two packages to solve the programming problem, since these were readily available on the network. The choices were IMSL from International Mathematical and Statistical Libraries, Inc. of Houston and IBM's Mathematical Programming System (MPS).

These packages present interesting contrasts. IMSL is a collection of subroutines that can be accessed by writing a Fortran main program. MPS, on the other hand, does not appear to have a Fortran interface. Instead, it is very user-oriented so an operations research analyst, for example, can program his model without a programmer's assistance. (This is not unlike the situation whereby a statistician or social scientist might use a statistical package without much assistance from a professional DPer.)

Satisfactory at First

At first, we found IMSL satisfactory for our needs. We already had written Fortran programs to reduce the data and generate input to the model and it was relatively simple to access the IMSL subroutine with those programs to solve the model. Staff members at New Brunswick and at Houston assisted us.

Problems began to arise, however, because of the "constraint matrix" of the linear programming model. This matrix was very sparse (the majority of the matrix's entries were zero). This can sometimes cause an algorithm to iterate many more times than one would expect for a problem of a given size. Indeed, a problem of 264 variables and 165 constraints is perhaps only intermediate in size, and we originally had expected no problems in getting the algorithm to iterate properly and converge to a solution.

What actually happened with IMSL was so many iterations were required because of this sparse matrix that round-off errors were being generated by the algorithm. Using a double-precision version of this algorithm still produced poor results — the computer runs were taking about three minutes of CPU time, and the algorithm was not converging even closely to an optimal solution.

Advice Offered

The IMSL people in Houston suggested we consider using the MPS package, which is obviously more specialized for problems related to operations research.

Of course, start-up time is higher with MPS, because, as with any package, one has to learn the rudiments of its control language. With IMSL, on the other hand, there is virtually no time lost in user orientation.

Another apparent problem with MPS was that a program had to be written to transform the data into a format compatible with the MPS system. This additional work proved quite worthwhile, however, since once the data was reformatted, MPS appeared adequate to our needs.

At first, we were wary of MPS because it had no feature for double-precision. As it turned out, double-precision was not necessary, and with MPS it took about eight sec-

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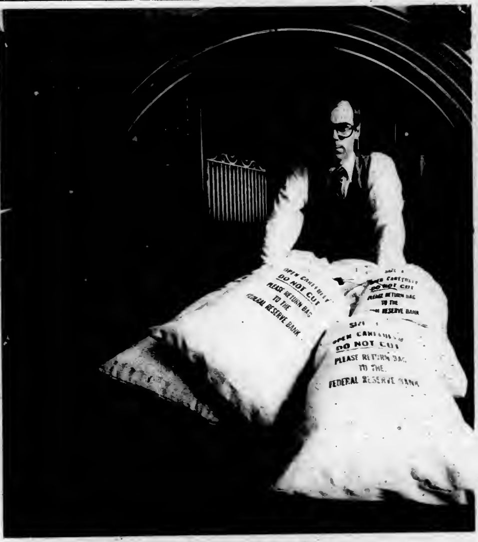

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Cathy Bible, Fox & Carskadon's Payables Clerk

Tough Selection Specifications Lead User to Appropriate Services

SAN MATEO, Calif. — Keeping tabs on the financial data of a multimillion-dollar investment corporation is not an easy task, but Fox & Carskadon Financial Corp. has simplified matters by turning to a remote computing service supplier.

An integrated accounting system tailored to Fox & Carskadon's specific needs supplies the software to maintain general ledger, accounts payable and fixed asset records for the firm.

"We like the reports generated from the system. It prints our checks, financial statements and balance sheets, and it is making things easier for us," Tom Steinberger, Fox & Carskadon's director of financial analysis and planning, explained.

All modules within Autocountant, supplied by McDonnell Douglas Automation Co. of St. Louis, are completely integrated. Each transaction, whether it is a receivable or payable, is automatically posted to Fox & Carskadon's general ledger, which reduces mistakes and saves time for the terminal operators. Reports and statements are uniform and standardized.

This integrated concept ensures Fox & Carskadon's accounts are always in balance so the books can be closed directly after the last transaction is posted in any given reporting period.

Steinberger found the Autocountant program easy to learn. Henry Leistikow, senior consultant of product management for McAuto in nearby Santa Clara, praised Steinberger as a quick study. "He learned quickly and immediately applied that knowledge to his needs at Fox & Carskadon. He not only became quite independent with the program, but he also taught several people in his department how to use it." Five or six of the company's staff now use Autocountant regularly from a terminal.

The daily work turnaround has greatly improved, according to Steinberber. Before McAuto began providing services, Fox & Carskadon used batch processing with another service firm. "We no longer wait three days to get back financial reports — we now get them back in several hours," says Steinberger.

The Selection Process

Steinberger looked into many forms of DP before selecting McAuto in 1977. "We had many alternatives, such as using other service companies or even bringing a minicomputer in-house. But the other companies we reviewed did not seem to have the size or reputation McAuto has."

Fox & Carskadon wanted an established service company with a reputation for a reliable and tested financial software program. "We did not want to be a guinea pig for a new company or new software program," Steinberger said.

In addition, it wanted:

- A terminal in its home office for increased control.
- The ability to generate reports and process data when it needed to, not when the service bureau had time.
- Access on demand.

"Trying to pick the hardware was also a difficult decision. There is so much equipment on the market and so many types of software we did not

(Continued on Page S/20)

"Our new Fortex on-line credit and A/R system is extremely flexible, highly efficient, and more than fulfills all our requirements"

Donald R. Stoll
General Credit Manager
Rohm and Haas Company
Philadelphia, Pennsylvania

Those words, from Mr. Donald R. Stoll, frame an important facet of the Fortex business philosophy. It emphasizes our dedication to system quality, design simplicity and functional output; factors inherent in all Fortex software products.

This particular Fortex system was designed and installed with the total commitment and involvement of the Rohm and Haas MIS personnel and the user group. As a result, said Mr. Stoll, "The CRT's lit up and the system went live in half the time, at half the cost of an in-house program. Because the software package was installed earlier and at lower cost than an in-house system, the payback was greater, and started earlier."

Another extra value of Fortex products is our system simplicity. In this installation it was necessary that end users could obtain and enter information easily, without being aware of the computer's needs. The Fortex C-ARMS system fulfilled that requirement.

We design our Systems with a high degree of flexibility, because we believe a system user should be able to talk "with" a computer... not talk "to" a computer. Talking *to* a computer complicates performing the job function; talking *with* a computer facilitates the job function.

Additionally, when a new system is easy to use it reduces conversion trauma. It requires less training and less mental reorientation. Training and use are simplified because Fortex documentation logically leads the user step-by-step through the process.

So, when your priorities dictate that it is time to evaluate software suppliers, remember FORTEX. Fixed assets, credit or A/R; on-line or batch, Fortex can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability. Fortex Data Corporation, 10 S. Riverside Plaza, Chicago, IL 60606. Tel: 312/454-1650.

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Financial Packages Help Bank Pick Up Profits

MIAMI — When Dadeland National Bank was sold in March 1977, its earnings history had been unimpressive. But there was a credit side to the bank's ledger. First, as its name implies, it was located in Dadeland, one of Miami's largest and busiest shopping plazas.

In addition, its $32 million in deposits were almost evenly split between checking and savings accounts. And the bank had a large and active "plastic" base with about 21,000 Visa and bank debit cards in customers' hands.

These were among the factors that made the bank's new management team, accustomed to stiff competition, confident about Dadeland's profit potential. That potential became a reality under the new regime.

The bank's financial turnaround was engineered through several policy and operational changes, the most dramatic of which has been a total revamping of the way it does business. The accounting, proof-and-transit and DP operations were brought in-house to cut costs and improve customer service.

Alternatives Explored

A large bank holding company had been providing Dadeland with full services in these areas. Since there were both long-term and immediate objectives to moving in-house, the bank studied all the alternatives, including software systems.

NCR Corp.'s Customer Information File (CIF) and Financial On-Line Customer Information System (Focis) packages seemed to meet Dadeland's requirements, so President and Chief Executive Officer Richard H. Dailey made arrangements with a service company that had an NCR 8550 processor and the CIF-Focis software to do the bank's processing.

These arrangements were made on a temporary basis, however, to provide Dadeland with time needed to crystallize plans for a DP service bureau in which it would be an equity participant along with another commercial bank and other private investors.

Branch banking is now allowed in Florida, and large holding companies should be able to lower their overhead through branch expansion. Without sophisticated DP systems, banks such as Dadeland would be hardpressed to compete in that environment, Dailey and his management team reasoned. They decided conversion should not be postponed until a service company was formed.

The CIF concept was embraced immediately, providing better management along with the added advantage of cutting processing costs. "We were paying nearly $14,000 a month for DP services since we were charged per item processed," Dailey said, adding, "If an individual had checking, savings and loan accounts with us, we were paying for the handling of three accounts for one customer.

"With CIF, these multiple charges were eliminated since these accounts were combined. Monthly DP costs dropped to $9,000 immediately and combined statements made possible by CIF also reduced postage costs."

The reorganization led to savings in other areas too. It had cost the bank $6,000/mo for outside support of its automated teller machines (ATM). Instead, the bank bought two NCR 770 ATMs and now, even with depreciation, maintenance and after-hours service, the cost is less than $2,000/mo." Proof-and-transit expenses dropped about $5,000/mo when that service was brought in-house, although that required installation of two NCR proof machines.

The transfer of bookkeeping helped Dadeland realize a small cost savings and a substantial gain in convenient customer service and improved reporting. Bringing all of these operations in-house had a dramatic impact, reducing overhead expenses, even though staff increased and salaries were raised.

Customer service improvements appeared hand-in-hand with cost reductions. "Customers like combined statements," according to Carlos F. Rodriguez, executive vice-president. In addition, he noted, "With on-line information, tellers can cash higher denomination checks without prior approval by officers."

Customers can ask any teller for balances. In the past, one teller was required exclusively for this service. Tellers can also obtain microfilm signature locations rapidly by making an inquiry to their 279 teller machines.

While implementing CIF-Focis, Dadeland changed its pricing structure. Previously customers could choose from four types of checking accounts; now only one is offered. Customers maintaining more than $300 in checking accounts are not charged. Those with balances below $300 pay a flat $3/mo. The overdraft charge also was increased from $5 to $7.50.

"We lost some accounts but, by and large, they were the unprofitable ones," Dailey said. "We have simplified operations, cut overhead and increased the amount of business our staff can handle."

Dadeland once had seven people who could open accounts. Now, two individuals work with new accounts. With

(Continued on Page S/22)

0 to 1200 users in three years flat.

Here's some of the reasons DOS/VS Installations lease software from Goal Systems:

"Why is your software so easy to install and use and everyone else's is so difficult?" — Tom Welch, Shelby Mutual Insurance Co.

"We haven't needed to condense any library since FLEE/FLIM was installed" — Dennis Tubbs, Westinghouse Electric Corporation.

"FAQS and FTL have provided us with the performance we have been striving for." — Omar Olsen, Warner Electric Brake and Clutch Company.

"Our daily VSAM backup used to take two hours with IDCAMS, but with FAVER it takes about 15 minutes." — Harold Dobbs, Venture Stores.

"It's about time somebody came out with a good VSAM dump/restore." — Bob Snapp, Parkview Markets.

"With EXPLORE/DISCOVER, I can at last see what my system is doing." — Gene Lane, The Limited Stores

"How can you guys sell this stuff so cheap?" — The first question from practically every user.

1977 datapro HONOR ROLL

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Package Earning Its Keep

Chemical Firm Capitalizes on Order System

SAN FRANCISCO — Sometimes a system developed to solve one user's internal problem is good enough to be useful to others and to earn back at least a portion of its development cost. Such is the case with a system created by Chevron Chemical Co.

A check for $40,000 was presented to Chevron last summer as the first in a series of royalty payments for an applications system Chevron called Order Entry System (OES) but which Rand Information Systems markets as the Comprehensive Industry Distribution System (Cids).

A key advantage is the system's ability to capture and summarize large quantities of operating detail and then make it accessible for analytical purposes to those who need it, according to Bob Carson, Chevron's manager of methods and computer liaison. "Almost anything you want to know, historically or currently, about product movement — from who ordered what, where and when, to, how and at what price it was delivered, as well as near future demand and scheduled product shipments — is at our fingertips."

As with most success stories, Chevron's system began with an idea: If computers could relieve accountants of time-consuming chores like computing payrolls and compiling financial data, why couldn't they be used to process information related to the physical movement of products — a job that operating personnel find just as tedious.

The project was started in 1969 under the sponsorship of Rowland Prideaux-Brune, vice-president and general manager of Chevron Chemical's Petrochemicals Division. By 1971, Archie Brock, distribution manager for petrochemicals, and Bob Carson, then distribution analyst for the Ortho Division, had designed and installed systems using CRT terminals and a central computer at San Francisco to transmit order information from Chevron's regional sales offices to shipping locations.

In concept, the system was designed to display information rather than print reports and to work equally well for industrial chemical orders of high value, a few line items and Ortho garden and home orders of many line items and high frequency and seasonality. The system maintained on-line inventories of all products at all shipping locations and made inventory and order status information continuously available.

Network Set Up

Early in 1970, a telecommunications network was established linking five cities to San Francisco. Customer order information was transmitted via CRT terminals between field offices and plants and warehouse. Now the network encompasses 54 terminals in 31 cities.

At Chevron Chemical, the order entry system has evolved into an expanded program called System for Planning and Operations Control (Spoc). Scheduled for completion this year, Spoc views all Chevron Chemical's operations as an integrated process. It will be used to optimize this process by continuously monitoring and controlling the transactions that move products through the company's purchasing, manufacturing, distribution and marketing functions.

"The information available from Spoc," Carson summed up, "will help management convert raw materials into revenue-producing finished products with a minimum of manufacturing facilities, working capital and operating expense."

Since the marketing agreement with Rand was developed in 1973, Chevron has provided continuous marketing support through explanations and demonstrations of the system to representatives from more than 100 prospective buyers. Thanks to these efforts, Chevron is looking forward to royalty checks from more Rand sales.

"The Fortex fixed asset system is proven, concise, well documented... programs compiled, test system run within hours. An uncommon event."

Michael G. Morris
Financial Systems Officer
Virginia National Bank
Norfolk, Virginia

Mr. Morris calls it an uncommon event, but at Fortex it's merely our normal way of doing business. All Fortex software product systems are operational; they are production-proven systems; they are concise and fully documented.

All Fortex systems, fixed asset, credit or A/R; on line or batch are easy to set-up and install because they *are* operational systems. Refering to Virginia National Bankshares' purchase of Fortex PIMS, Mr. Morris stated, "...our data processing folks are much impressed with the concise, tested and well documented manner of the System. The material and information was so clear that the programs were compiled and the test system run within hours of receipt of the tape...an uncommon event."

But we realized our deepest sense of pride from what Mr. Morris describes as, "One of the most significant aspects of my dealing with Fortex...their excellent responsiveness to inquiries regarding use of the system, even in aspects for which it is not designed. This is again an uncommon occurrence in my experience."

When asked what he liked most about Fortex PIMS System, Mr. Morris stated, "to summarize, PIMS Is: ☐ a concise, tested system with sound data processing integrity ☐ a well documented, user oriented system ☐ a system with flexibility for implementation ☐ a product from a company which has obvious pride. So, when your priorities dictate a new software package, call Fortex. We can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability. Fortex Data Corporation, 10 S. Riverside Plaza, Chicago, IL 60606. Telephone: 312/454-1650.

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User's Effort Plus Package Eases Conversion

(Continued from Page S/2)

fined purpose so that the whole problem of a learning curve is eliminated, according to Simmons.

About three years ago, NII Metals became aware of the facilities and features of the General Ledger package from Software International Corp. when the company's parent corporation began an effort to install the package on an IBM 360/65.

That project never got off the ground, but the failure wasn't caused by any problem in the software; it resulted from the way the corporation was attempting to install it, Simmons said.

System/34 Acquired

Although NII Metals lost interest in the corporate project, it liked the software and got the IBM System/3 version for its own use. That was up and running for several months when, for reasons unrelated to ledger accounting, the company decided to convert to an IBM System/34

At that time, Software International had not announced that it had an S/34 version, so Simmons and his people began digging into the S/3 package to see if it could be adapted to the new environment. They chewed on that project for almost two months before recognizing that Assembler on the S/3 used for I/O coding was just plain incompatible with Assembler on the S/34.

Once his staff identified the problem, Simmons went back to Software International and got the Cobol-coded I/O subroutines from what he believes was a Honeywell, Inc. version of the ledger package. They compiled and gradually debugged that system on the S/34, finally merging the cleaned-up I/O routines with the Cobol application logic from the S/3 package.

Sounds Easy, But ...

Simmons' brief recitation made it sound easy, but he then pointed out a few problems. While Cobol is a fully supported language for the S/3, it is available from IBM only on a request-for-price-quotation (RPQ) basis for the S/34. NII Metals, in fact, got the compiler that way — for $85/mo — but the in-house staff wasn't geared to the language: they only use it for the general ledger processing.

Software International didn't have anyone available to help when Simmons and his crew were attempting the conversion on the S/3 package, so Simmons went to an outside custom software firm comprised of people who knew the ledger system. Together NII Metals and the consultants got things moving.

At about this time, Software International gave Simmons a prerelease copy of an S/34-based ledger package. "We installed it, it worked and we've had a ball with it," was the way he described what happened once his company got the package.

Feelings Genuine

While that kind of reaction may sound artificial, Simmons was quick to put it in perspective by noting that he'd worked with other packages from Software International and just wasn't as impressed with them as he has been with the ledger system. "It's super," he said.

Bringing that comment down to earth, he said he liked two things in particular about the package. The first was the underlying data base structure of the system, which allows linkages between the master and other files based on pointers.

In addition, he called the report writer feature "outstanding," noting that it "literally took the problem of meeting the ledger reporting requirements right out of my hands." He explained that people in the accounting department can define their needs and code the programs "in the same amount of time it would have taken to tell me their needs."

To put this capability in the hands of the end users involved some effort on their part, he said, adding that one of the accounting users had to spend three days in a class.

To balance the picture, Simmons noted that the ledger package in both the S/3 and S/34 settings is "a bit of a core hog."

Willing to Work With It

His willingness to work with the package — and to stretch it when and if it seemed useful to do so — was illustrated by Simmons comment that his staff, working with the consultants, had added on-line screen support to the system.

As far as he could recall, the packages Software International offers the small IBM system user are batch-oriented, but NII Metal's implementation on the S/34 uses the Workstation Utility system to put the ledger logic on-line. He seemed pleased not to be working with the communications support that had been provided on the S/3.

General ledger isn't the only application Simmons has implemented through the package route. The company has an IBM field-developed program for accounts payable and what Simmons freely admitted is a bastardized version of an accounts receivable system from a firm that doesn't even sell software as part of its regular business.

"We heard it had this system so we asked about it. It seemed to do a lot of what we wanted so we got it . . . then went to work on it ourselves to fit our particular needs. I don't know if you'd call that a package or not."

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PRODUCTS FOR PERFORMANCE

Tough Specs Pay Off for Investment Firm

(Continued from Page S/16)

know which was the best," Steinberger said. Fox & Carkadon's hardware needs are being filled by a programmable Sycor, Inc. Model 350 terminal with a floppy disk for data storage.

Steinberger picked the Sycor unit over a number of other roughly comparable devices and has high praise for both Sycor's and McAuto's efforts in helping him interface the terminal and the network. He is the first person to use the Sycor 350 with Autocountant, he said.

Problems at First

Although he did some programming in college, Steinberger encountered a few problems when the Sycor unit first arrived. It had good software, he explained, but poor instructions on how to use the utilities, how to generate the software emulators needed to link the unit into the McAuto net and even how to key in negative values such as those that would be represented by minus overpunches on card input.

Now things are moving along smoothly. Data is keyed into the terminal and stored on floppy disks until ready for transmission to McAuto in Long Beach, Calif., at 4,800 bit/sec. "The terminal has worked out very well and has fulfilled all our requirements and more," according to Steinberger. Reports can be printed at 300 line/min on the Sycor Strider printer at Fox & Carskadon's office.

Steinberger has yet to do any original programming on the 350, but he expects to use the terminal for local processing as the year progresses. "We'll probably use it for simple calculations first, just to relieve our clerical staff," he said. Payroll is another possible area, although he noted that since it wasn't his responsibility, he couldn't say for sure whether it would be put on the system.

Meanwhile, however, work with Autocountant has gone well enough so that Fox & Carskadon has added the fixed asset accounting routine to the services it is using from McAuto. The move away from a conventional outside service bureau has given Fox & Carskadon people a sense that they are once more in charge of their work, according to Steinberger.

"The system works well and the timing of the output of our accounting records is controlled by what we do here instead of whatever may be happening at our processor's shop. That's a good feeling," he concluded.

Package Fits Special Need

(Continued from Page S/15)

onds of CPU time to converge to an optimal solution.

Working with MPS also presented some technical problems. First, the package is no longer supported by IBM; it markets Mathematical Programming System Extended (MPSX) as a program product, while MPS was — and is — available at no charge. Although no serious problems occurred with MPS, our IBM representative offered to provide assistance if necessary.

Second, because MPS is an older system, it is geared to 2314 disk packs rather than 3330s. The Educational Computer Network has had to revise the MPS program libraries to conform to 3330 packs.

In summary, we learned the need to weigh the relative advantages of a general package like IMSL against those of a specialized one like MPS. Both packages are widely respected and used. The former covers a wide range of algorithms in mathematics, statistics, computer science and operations research, while the latter is specialized in operations research.

Clearly, if a user's needs are specialized, it must make an effort to seek out specialized package software, especially if the high cost of custom program development is to be avoided.

Feuerman is a senior systems analyst/programmer in the Department of Information Processing and Sheffet is a faculty member in the Department of Preventive Medicine at the College of Medicine and Dentistry of New Jersey, Newark, N.J.

"The choice was obvious... FORTEX! Their A/R system provided features beyond our planning and expectations."

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Data Processing Manager
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"Minolta's accelerated growth rate had rapidly outmoded our semi-automated A/R system. A limited staff dictated finding a proven, operating package that would fulfill our needs and offer expansion capability. We limited our study to those systems with on-line capabilities, written in COBOL and using the DOS operating system. At this point, Data Processing and the Credit Department investigated the operational and functional characteristics of the remaining systems. The choice was obvious.

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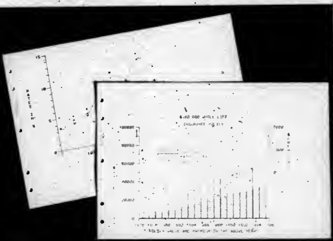

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CW-1/79

User Role in Installation Helps Bring About Success

(Continued from Page 5/5)

definition of their information needs. The flexibility of CIF allows for modification of certain sections of the software even after conversion began.

The CIF package has a macro-generated feature called Account Data List Maintenance (ADLM), which eased the customization of the system. While the sample applications subfile data formats were comprehensive as released, additional data on some subfiles was needed to satisfy the information needs of a particular user area.

For example, user areas which do not have on-line inquiry into the applications files plan to use the inquiry functions of CIF and require access to additional specific data. With ADLM, there was no difficulty in adding the information and making it available to existing on-line functions for maintenance, a bank spokesman said.

"We were able to integrate a manual safe deposit system into the CIF since ADLM also allows for the addition of new functions and applications with sample procedures," according to Rich Senseny, corporate systems CIF project manager.

Another macro feature is the Application Mapping Service (AMS), which allows the modification and addition of screen formats to support the data format changes made with ADLM. Screens can be modified very simply to suit the needs of the user areas, Senseny said, and this modification can continue without a major effort as the system evolves and as needs change.

"In addition to giving a high degree of flexibility, this feature also gave the DP group the confidence to make changes in formats without worrying about interfering with the applications logic," he explained.

Immediate Benefits

F&M has already begun reaping CIF's benefits. The design and implementation of an electronic funds transfer system was accomplished within CIF in a shorter time frame and with less trauma than would have been possible without it, bank officials said.

The true measure of CIF's success at F&M, however, will be the extent to which it is used to identify and deliver services to the public. The package establishes the foundation for automating ruutine banking functions and for increasing capabilities for personalized service in nonroutine banking functions. Both the consumer and the bank benefit.

The complex banking relationships of large corporate customers fit neatly into the structure of CIF. Once the structure is established, it becomes feasible to do meaningful customer profitability analyses and to understand why some customers are more profitable than others.

That understanding makes possible the pricing and cross-selling uf services to increase customer profitability. This would be virtually impossible without CIF.

Bank Picks Up Its Profits

(Continued from Page 5/17)

less time needed to explain checking account options, these individuals concentrate on cross-selling banking services and obtaining customer information that can be used later in marketing efforts.

"Our people can provide better service because they have the tools they need," Dailey said. "It takes less than 30 seconds to get a printed profile of a loan applicant's entire relationship with the bank."

Dadeland's management was pleasantly surprised that its automated teller transaction volume remained steady with the conversion. The bank previously had shared a massive card base with the holding company, which operated nearly 27 ATMs throughout the state. Figures indicated that 20% of Dadeland's ATM transactions were made by customers holding cards issued by other banks.

"But there was no drop in transaction volume," Rodriguez said. "We are running approximately 20,000 transactions a month through the two NCR 770s. It appears our customers are using ATMs more. We think that's because the new machines are easier and faster to operate and are seldom down."

Independent banks must embrace the ATM market in order to compete, Dadeland's officers believe. While industry figures indicate that average check-processing costs range from 60 cents to $1. Dadeland's average ATM transaction cost is less than 15 cents.

Carloa Rodriguez, executive vice-president, talks with platform officer Laura Nugent as she works on Dadeland Bank's CIF records.

Dadeland's ATM units can be accessed by either bank debit or Visa credit cards, an option offered by the bank holding company, too. To convert its card base, Dadeland issued new bank debit and Visa cards along with an explanatory letter. NCR wrote conversion programs that allowed customers to retain their previous personal identification numbers.

Dadeland has recently initiated an ATM interchange agreement with another commercial bank and expects this program to expand to other banks.

"We want to be known as a high-performance bank," Dailey concluded.

Firm Beefs Up System to Handle Production

(Continued from Page S/7)

quotes on special orders. In some bulk orders, for example, packaging is not needed. In that case, Wendell Keene, the national sales manager, can deduct the cost of packaging to determine Rogers' real cost for the item.

"Or a customer may want to place a special order. We can combine the costs of all the components that make up the special item to estimate costs," Keene said. "Through information contained in the data base and use of the costing module, the system can simulate changes for us, showing how engineering or materials changes would affect the cost of an item."

Should the simulation show the change would be beneficial, it can be implemented as soon as practical and the affected cost reductions would be reflected in the report at the same time.

"In effect, we receive daily reports on the actual costs of every item in our line. That's useful to us, but it affects the customer only when it's time to alter the price. If we see that costs have risen enough to narrow our profit margin beyond acceptable limits and if efficiency changes cannot maintain the lower costs, we may raise the price. Before, we only estimated, figuring that if materials and labor rose 10%, our prices should too," he recounted, adding that guesstimates of that sort were never very accurate.

The switch to computerized production control was remarkably smooth, according to O'Brien. Upgrading to the larger B1717 and adding PCS-I was just a matter of tailoring the system to Rogers' requirements. The implementation took place after Rogers personnel attended Burroughs customer education courses.

O'Brien said Burroughs was a great help in smoothing the transition to PCS-1. The company's account manager made sure communications were kept open between Burroughs and Rogers. Rugers was selected as a pilot site for the order release module added to the package in late 1977 and for the on-line inquiry module released in 1978.

"With our present method, each day's time cards, workstation reports and other input is keypunched at the beginning of the day. By noon, we can have reports of our status as of 7 a.m.," O'Brien stated.

Rogers' on-line inquiry program allows the data to be accessed through a CRT without disrupting the keypunch work flow.

"The compatibility of our production control system with the rest of our operation is another plus," O'Brien pointed out. "PCS-1 carries the product from the raw material stage to our warehouse. At that point, the product is effectively 'shipped' and eliminated from the PCS-1 system. Our Business Management System (BMS) software — also from Burroughs — takes over from there, handling finished goods inventory as well as our basic financial modules. The PCS-1 and BMS application programs operate on the same CPU.

Ledger System Well-Chosen

(Continued from Page S/13)

our requirements.

Once our committee felt comfortable in its understanding of the systems' mechanics, our next task was contacting users.

In particular, this part of our evaluation gave us insight regarding why particular systems were chosen, how long the installation period should take and the extent and adequacy of vendor support. We also explored the problems uncovered during implementation as well as the manner in which the problems were resolved, as well as the value and amount of training given both prior to and during installation.

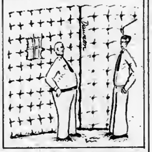
Finally, our user contacts shed light on the extent to which the various system modules in each package were actually utilized and the relative time to process the various jobstreams.

Mission Accomplished

Out of this process we found and acquired a package that suits us well. It meets the criteria we established, including the assurance that the report generation portion of the system could be run without our having to depend on the DP staff.

The two intense training schools and the on-site support provided by McCormack & Dodge Corp. for the G/L Plus package — our choice — have been excellent. The software as well as the vendor personnel have performed as promised.

Aumack is corporate/budget manager at Spencer Gifts, Inc. in Atlantic City, N.J.



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ADDS Regent 200

The printers were so loud you couldn't hear yourself think. Till we bought ourselves a little peace and quiet.

I'm Harold Feinleib. About a year ago we purchased over 80 ADDS Regent 200s for our programming and systems staff at National CSS.

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Three Units Cap Burroughs B1800 Line

DETROIT — Burroughs Corp. has topped its B1800 minicomputer series with three machines aimed at transaction processing and network applications.

The dual-processor B1885 offers at least 50% more computing power than earlier B1800 systems, Burroughs said. Its two processors share 512K bytes of memory, a 130M-byte dual-disk drive, a 750 line/min printer, multiline data communications control and an operator CRT terminal. Processor memory is expandable to 1M byte.

With a single processor, the "mid-range" B1855 also offers 512K bytes of memory expandable to 1M byte. The B1855 features a 65M-byte dual-disk drive, a 750 line/min printer, multiline data communications control and an operator CRT terminal.

The B1815 "entry-level" model provides 128K bytes of storage expandable to 256K bytes with its single processor. It includes a 37M-byte dual-disk drive, a 350 line/min printer, single-line control for data communications and an operator CRT terminal.

All three models allow users to enter data or ask questions and receive "immediate" responses, Burroughs claimed. When linked into networks, the systems can communicate with each other and with host mainframes.

The systems are available with transaction processing software which reportedly includes a "more powerful" Master Control Program (MCP) and software systems for on-line data entry, on-line program development, data communications, reporting and data base management.

Software Offerings

Along with the three systems, Burroughs introduced Interactive Basic, Ansi 74 Cobol, Ansi 77 Fortran and RPG-II compilers that allow the B1800s to accept commercial and scientific applications from other systems.

The latest B1800s can run with Burroughs' Computer Management Systems (CMS) software. CMS application programs are interchangeable across the entire Burroughs line of smaller systems, allowing users to intermix B80, B800 and B1800 systems in networks or expand their DP power up to 15 times without reprogramming as they upgrade, a spokesman maintained.

Burroughs' MCP-Transaction Control System (MCP-TCS-I) supports the B1815. This operating system offers MCP, the Network Definition Language (NDL) for generating data communications control programs; the On-Line Data Entry System (Odesy), an on-line reporter that allows terminal report generation, a text editor and system utilities.

Burroughs' MCP-TCS-II operating system supports both the B1855 and B1885. The system incorporates MCP, NDL and Odesy as well as the Data Management System II with a special data inquiry capability. Command and edit software allows on-line terminal report generation.

The B1815, B1855 and B1885 minicomputers cost $60,000, $85,000 and $133,000, respectively. Monthly leases on a one-year plan are $1,849 for the B1815, $2,301 for the B1855 and $3,450 for the B1885.

The MCP-TCS-I and MCP-TCS-II operating systems have monthly license fees of $128 and $458, respectively. The RPG-II, Interactive Basic, Ansi 74 Cobol and Ansi 77 Fortran compilers have monthly license fees of $52, $75, $75 and $120, respectively.

Field engineering service availability for eight-hour/five-day coverage is included in the lease rates, Burroughs said, noting that around-the-clock service is also available.

Nova-Compatible CPU Runs One Instruction in .4 Microsec

IRVINE, Calif. — The latest minicomputer from Educational Data Systems, Inc. executes a complete arithmetic instruction, including pickup, in .4 microsec and accepts system software written for Data General Corp. Nova or equivalent minis, according to the vendor.

The Point 4 was named for its instruction cycle time, which also puts the system in the performance class of DG's Eclipse and Digital Equipment Corp.'s PDP-11/70 minis, a spokesman claimed.

With a 16-bit instruction set, the Point 4 accepts the Iris operating system, as well as Mighty Mux and other software designed by Educational Data Systems for Nova-type systems. The standard instruction set can be extended by a writable control store featuring a 100 nsec cycle time, the spokesman noted.

The mini includes 64K words of semiconductor memory on a single printed circuit board. The vendor plans to offer special instructions for stack operations, byte manipulations and floating-point arithmetic.

The Point 4 can meet the need for distributed or redundant processing because its interprocessor bus allows the mini to communicate with other CPUs at speeds up to 2M word/sec, the spokesman said.

The resident programmable read-only memory (Prom), written in APL, loads a software program that permits all normal control panel functions to be performed through the master CRT terminal. This reportedly precludes the need for a standard control panel.

The Point 4 comes with a built-in software debugger and hardware self-test capability. Its "APL switch" initiates the loading of Prom into the top 1,000 words of random-access memory. Activation of this switch in combination with a self-test switch starts the hardware diagnostics procedure.

An APL program within the Prom includes an octal debugger routine. This routine debugs specified applications software on the Point 4 and also tests the system's accumulators, program counter, memory entries, memory searches, movement of data blocks within memory, addressing offset, reading and verifying of binary paper tapes and execution of automatic program load from each direct memory access device.

The Point 4 costs $4,500 in OEM quantities. Educational Data Systems is at 1682 Langley Ave., Irvine, Calif. 92714.

On-the-Scene Data Center

Turnkey Vendor Makes Pitch By Rolling Mini to User's Door

INDIANAPOLIS — Lycor, Inc. here is moving its mini. Literally.

The systems builder is not moving to a new facility — it's trucking its turnkey minicomputer system, designed for insurance companies, around the country in a specially equipped, $40,000 motor van.

When the firm developed the system, it decided to take the mini to the customers rather than fly prospective customers into Indianapolis for demonstrations, according to Harry W. Lydiksen, Lycor's president.

The vehicle, called the Level 6 Mobile Data Center, was modified to house a Honeywell, Inc. Level 6 Model 47 minicomputer with 1M byte of memory in a 30-in. mini rack, a 600 line/min printer, an eight-line communications processor, an 80M-byte storage module, a dual diskette and Honeywell VIP 7801 terminals.

The Level 6-oriented system provides insurance companies with a method for more efficient handling of life insurance, property casualty and credit life policies, according to Mo Miller, vice-president of marketing, and Tom Jasick, vice-president of support services at Lycor.

When the motor van arrives at a customer site, the system is plugged into a 110-volt, 30-amp power source, and the mini becomes operational.

John Ellis, a program manager for Honeywell's Minicomputer Systems & Terminals Operation Special Customer Accounts, noted that the van is equipped with special frames to secure the standard hardware. "The frames insure against excessive vibration that might occur during relocation," he explained.

Disk Stores 600K Bytes

BERKELEY, Calif. — A single/double-density disk system capable of storing up to 600K bytes on each side of IBM System/34-compatible diskettes is available from Thinker Toys.

The Discus 2D comes fully assembled with a controller board and a cabinet-mounted Shugart Associates, Inc. SA800R disk drive with power supply.

The S-100 controller board employs the Western Digital Corp. Model 1791 controller chip and has power-on jump circuitry, 1K byte of random-access memory, 1K byte of read-only memory with a built-in monitor and a universal asynchronous receiver transmitter (UART).

Discus 2D software includes virtual disk Basic (Basic-V), a disk operating system and the Disk/ATE assembler and editor. Optional software includes a version of Digital Research, Inc.'s CP/M operating system.

The complete disk system costs $1,149. Each additional disk drive costs $795, Thinker Toys said from 1201 Tenth St., Berkeley, Calif. 94710.

Scheduled for Six Cities

Datapro Plans Course on Minis

DELRAN, N.J. — Datapro Research Corp. will offer guidelines for evaluating, buying and using minicomputers or small business systems at a two-day course that will be presented in six major cities.

The course will compare the capabilities of available minis and small business systems as well as associated terminal systems: It will also explore the meaning of intelligent terminal systems for mini users; the nature of emerging network/coupled systems; the differences between distributed processing and terminal network schemes; and ways to rate system adaptability.

In addition, the course will cover "the impending confrontation" between minis and mainframes, the use of software houses, the direction of word processing and suggestions on when to develop systems internally.

The course will be taught by William E. Augustine, an independent contractor and consultant to minicomputer and terminal vendors, network service firms and end users.

It will be given in Washington, D.C., Feb. 8-9; Los Angeles, Feb. 22-23; Philadelphia, March 1-2; Chicago, March 15-16; New York, April 2-3; and San Francisco, April 19-20.

Registration costs $455 for current Datapro subscribers and $495 for nonsubscribers; the fee includes course materials and meals.

When three registrants from a single company register, a fourth registrant can attend without charge, Datapro said.

More information on the course is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

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Double-Sided Disk Offers 400K Bytes Per Drive

TORRANCE, Calif. — A double-sided, double-density minifloppy disk system that provides 400K bytes of formatted usable storage per drive is available from Vista Computer Co.

The Vista V400 includes Vista's version of the Digital Research, Inc. CP/M operating system, which allows storage of up to 64 dynamically allocated, named files on each diskette.

Each file can contain up to 400K bytes and operates with most computer systems based on the Z-80 or 8080 microprocessor that hold at least 24K bytes, Vista said.

The V400 system includes a dc power regulator board with at least one minifloppy disk drive; an internal power supply; S-100 bus controller card; Vista's CP/M; an extended Basic compiler on 5.5-in. diskettes; and documentation.

A Vista spokesman claimed the disk system is ready to use as soon as it's plugged in. It costs $999 from Vista Computer Co. at 2909 Oregon Court, Torrance, Calif. 90503.

Magnetic Tape System Includes 48 Vdc Option

JESSUP, Md. — A line of minicomputer magnetic tape peripherals introduced by Digi-Data Corp. reportedly includes a 48 Vdc option in place of the standard ac power circuitry for battery-operated or backup applications.

The Series 40's dc option incorporates a 20 KHz transformer-coupled, dc-to-dc converter to provide all operating power for the tape drive and its embedded formatter, according to the firm.

The option "meets the strictest international standards" for the telecommunications industry, a spokesman claimed.

The 48 Vdc option is available on all tape drives in the Series 40 family. Circuitry for the option is mounted internally for the Model 1749 (10.5-in. reel) and Model 1649 (8.5-in. reel) machines and in a small outrigger box for the Model 1149 (7-in. reel).

The circuit includes a soft start-up and prevents initial current surges that could affect operation, the firm asserted. The 48 Vdc converter is specified for operation with voltages from 40V to 56V.

The 48 Vdc option is priced at $300 in single quantities from Digi-Data at 8580 Dorsey Run Road, Jessup, Md. 20794.

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Microdata

Still Working on the Add-On Memory Project, Huh?'

Enhancements Double Datapoint 1500 Storage

SAN ANTONIO, Texas — Datapoint Corp., in an effort to increase the cost-effectiveness of its Model 1500 dispersed processor, has announced enhancements to the unit's diskette storage, main memory and communications capabilities.

The 1500 can now support up to two diskette modules for a total of 1M byte of on-line storage, according to a spokesman. Each module houses two diskette drives and uses single-density diskettes to store up to 500,000 characters of information.

The 1500 formerly supported up to 512K bytes of on-line storage.

A complete 1M-byte 1500 system can be purchased for $8,975. Already-installed 1500s can be upgraded to 1M byte for $3,675, including all the hardware required, the spokesman said.

In addition, while the original 32K-byte main memory version of the 1500 will still be produced, the 1500 can be purchased with up to 60K bytes of main memory for $7,900. Users of 32K-byte versions of the 1500 can upgrade their systems to 60K bytes through a field-installable memory upgrade kit that sells for $1,920 with a $125 installation fee, according to the firm.

A Datapoint 1500 costs $10,895 with 60K bytes of main memory and 1M byte of diskette storage and $5,950 with 32K of memory and 512K bytes of storage.

Software Releases

Accompanying the 1500's expanded main memory are new releases of its disk operating system, Databus and Dataform. Reportedly compatible with all previous 1500 software releases, these releases were designed "to take advantage of the larger main memory capacity of the 1500."

Programs run under the 1500's Job concurrent tasks program can be up to 10K bytes in length (an increase of 40%) "to permit larger and more complex tasks to be executed concurrently with a printing or communications program," the spokesman said.

The sort and index utility programs of the disk operating system can be executed concurrently with a printing or communications task as well, according to the firm.

The disk operating system's edit program uses all available memory in a circular buffer to permit users to scroll through longer files.

In addition, Databus for the 1500 is said to allow record compression of Isam output and to permit overlays to reside in memory, conserving file space and speeding program execution.

Communications Emulator

Besides those enhancements, a communications emulator known as the CC278015 is available for use with both the 32K- and 60K-byte versions of the 1500 processor.

CC278015 emulates the IBM 2780 data communications terminal, using the 1500's integral synchronous communications interface. It also permits communications to take place at the same time as data entry or processing operations and includes capabilities for horizontal tab, primary or secondary terminal and normal and transparent transmission.

Other capabilities of the CC278015 include ENQ retry, space compression, two- and four-wire operation, Ebcdic transmission code, point-to-point operation and software VFU, the spokesman said.

The emulator is included with all enhanced 1500s, and other 1500 users can license it for a one-time fee of $20.

The Datapoint 1500 includes an integral synchronous communications interface and a 12-in. diagonal (1,920-character) CRT screen.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

Some of the recent items explored in the Candle Computer Report

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Initial Savings of $200,000

Firm's Return on Mini Investment Tops 100%

Special to CW

BALTIMORE — An on-line purchasing and receiving system based on a minicomputer saved $200,000 last year for a large manufacturer of air cleaning, water treatment and soond control systems here.

Environmental Elements Corp. (EEC) expects to save more than $400,000 annually as soon as other systems are implemented on the mini. Thus far, the firm's return-on-investment in the mini — before interest and taxes — has exceeded 100%.

EEC depends un a Hewlett-Packard Co. 3000 to monitor the status of orders for raw and finished materials from mills and warehouses. Before acquiring the mini, EEC's material requisitioning process usually took about 10 days to complete, but now only three days are normally required, according to Hank Lancaster, the firm's vice-president for engineering development.

This speedup in processing allows more time for EEC buyers to shop around and find the best price, Lancaster noted. The system has also reduced the workload in such organizational areas as purchasing and planning, allowing the company to shore up other types of activity.

Further, the system provides reports that summarize the transactions of each corporate department, enabling top management to better assess performance and identify trouble spots.

Vast Network Planned

As a subsidiary of Pittsburgh-based Koppers Co., Inc., EEC uses the HP 3000 to communicate with Koppers' Burroughs Corp. B6700 mainframe. Koppers plans to establish a vast distributed processing network that will encompass EEC's mini as well as computer systems at other subsidiary sites, according to Lancaster.

The Koppers connection allows EEC to use the large-scale scientific programs stored on the Pittsburgh mainframe. For example, the firm can access, through dial-up phone lines, a program called Stress to perform strength calculations. Another program is used remotely to develop proprietary designs for EEC fans.

The HP 3000 is used almost 24 hours a day, six days a week. The four-person EEC computer services group is responsible for the system's total operation.

The group's duties include system design studies, application program testing, system implementation, end-user training, program maintenance and operation of the CPU.

There is no full-time computer operator, Lancaster noted. The software application programs were written in SPL for the on-line purchasing and receiving system, while Fortran is used in developing a batch inventory control system as well as personnel, payroll and cost-accounting systeins. A shop scheduling and floor control program is planned.

EEC plans to run an average of 20 jobs simultaneously on the HP 3000 in both batch and real-time; most of the batch work is currently performed in the evening.

Reason for Choice

EEC chose the HP mini over a larger mainframe for price/performance reasons. "We felt we didn't need a larger system after we saw products from about 15 minicomputer vendors, and only HP had the right combination of capabilities," Lancaster recalled.

EEC's demands included a data base management system (DBMS) "applicable to our needs" as well as a "real-time capability to handle 32 users simultaneously," he continued.

The current facility includes the HP 3000-II computer system with 512K bytes of core memory, two 47M-byte disk drives, une 50M-byte disk drive, one 15M-byte swapping disk file, two tape drives, one 200 line/min printer and one 300 line/min printer.

The system peripherals include 19 HP 2640 CRT terminals and nine HP 2762 teleprinters. Those devices are placed in various EEC departments in Baltimore and at the manufacturing plant five miles away.

The HP Image DBMS reportedly allows data base creation and description of data structures as well as logic restructuring of the data. Query, a self-contained HP language package, is said to allow data base access through use of English language key words.

Correction

Pilgrim Electric Co., which is offering the Voltecor ac power conditioners, was incorrectly placed in New Jersey [CW, Dec. 11]. Pilgrim is at 29 Cain Drive, Plainview, N.Y. 11803.

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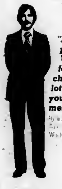

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Small Police Departments Get Power

By Ann Dooley
CW Staff

ST. LOUIS — A research group here is developing a way to provide small and medium-size police departments with the kind of statistical patrol and manpower information previously available only to police departments in large cities.

The system is based on microcomputers, and the research group is The Institute for Public Program Analysis (Tippa), a nonprofit organization. Tippa's work is being supported with a grant from the Law Enforcement Assistance Administration (LEAA).

The idea was born about two years ago when a Tippa staff member realized that many of the calculations from the MIT-developed Hyper-Qube queuing program, which is used by large police departments to monitor patrol cars, could be transferred to a programmable calculator or a microcomputer system.

A police operations planning system called Patrol/Plan evolved from that observation. When completed, Patrol/Plan will allow a police department to determine such things as how many patrol cars are needed, the effects of reducing or increasing that number and where and when the cars are needed most.

The software is still in the process of being developed, but prototype systems are being field-tested by police departments in Springfield, Mo., Stockton, Calif., and Norfolk, Va. Each department underwent training in the use of the system and is providing feedback to Tippa on how the system meets its needs.

One Department's Experience

Although Sgt. Ira Copeland of the Springfield police department has not tested it extensively "in the streets," he said he thinks the system will prove very beneficial.

His department has borrowed a Commodore Business Systems, Inc. Pet 2000 system with 8K bytes of memory for the field test. The city's square mileage, the average patrol speed, patrol schedules and other basic geographic and statistical information has been entered into the microcomputer to create an operating base, Copeland noted.

The patrol car deployment system will be used to determine the number of cars being used for each service during each hour, the number responding to calls and how long each call takes. Copeland also intends to use the system to determine which cars are on nonservice work — such as lunch breaks — at different periods of the day.

In addition, the system will be used to determine how much time is spent answering calls and how much is spent patrolling. It will also indicate whether all cars would ever be tied up at one time and how many are usually free at any given time.

If the response time in answering a call seems long, the system will be used to point out how to reduce that time by better patrol car deployment, Copeland said.

The system will also aid in long-range planning by providing statistics on crime trends, accident investigations, life-cycle costs of a patrol car, budgeting and future department needs.

In February, Copeland's department will begin testing another system — Patrol/Plan II, which allows more flexibility than the initial program. With Patrol/Plan II, data can be entered for all three shifts at one time to allocate the

(Continued on Page 56)

Micro Chips

Participation Asked In NCC Festival

NEW YORK — Hobbyists and professionals in personal computing are invited to participate in the Personal Computing Festival of the 1979 National Computer Conference at the Americana Hotel here June 4-7.

Individuals will receive prizes for their efforts, according to festival chairman Richard A. Kuzmack. Those interested in participating in program sessions or submitting papers should contact Jay P. Lucas at 3409 Saylor Place, Alexandria, Va 22304, by March 15.

Outstanding application demonstrations will also receive prizes. An application form and an exhibitor's kit can be obtained from Edward J. Fox, Department of Defense, Mail Stop S34, Fort Meade, Md. 20755.

Further information on NCC '79 can be obtained from the conference sponsor, the American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645.

Winning Chess Game Detailed in Book

ROCHELLE PARK, N.J. — The computer chess program that won first prize in the chess tournament at last year's West Coast Faire is now available in a book.

Entitled *Sargon: A Computer Chess Program,* the book by Dan and Kathe Spracklen contains all algorithms, a block diagram of the program, a Z80 Assembly language listing of the program and an index to the subroutines.

The book costs $14.95 from Hayden Book Co., Inc., 50 Essex St., Rochelle Park, N.J. 07662.

Handles DTMF Conversions

Board Ties S-100, Touch-Tone Phone

RICHMOND, Va. — MK Enterprises has introduced a Dual-Tone Multifrequency (DTMF) transceiver board that interfaces an S-100 microcomputer to a Touch-Tone telephone.

Designated the MK-II, the board converts Bell System's DTMF into binary and binary into DTMF, creating a fully operational Touch-Tone transceiver, according to a spokesman.

On incoming calls, vectored interrupts allow ring detection as well as the detection of DTMF signaling. This capability allows a user to call up a computer by punching buttons on his phone.

A 4-bit input port permits additional data to be transferred along with decoded DTMF.

On outgoing calls, dialed digits are loaded into a buffer at processor speed and unloaded into a DTMF generator at a rate compatible with Bell System equipment, the spokesman said.

The MK-II can be used to monitor and tabulate outgoing calls as home security "dialers." It costs $425 from MK Enterprises, 8911 Norwick Road, Richmond, Va 23229.

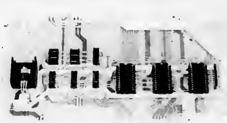
Card Links S-100, Circuit Tester

MOUNTAIN VIEW, Calif. — Pragmatic Designs, Inc. has introduced an I/O card that links the firm's ICTM-1 integrated circuit tester module to S-100 bus computers.

While primarily intended as a dedicated interface, the IF-1 can also be used as a general-purpose I/O card in applications which require up to 16 output lines and eight input lines, the company said.

IF-1 provides two fully buffered 8-bit output ports and one fully buffered 8-bit input port. I/O address decoding is jumper-selectable on any four-port boundary in the system I/O address space.

All 24 I/O lines are brought out to a single 50-pin mass terminated cable connector. The signal lines are reportedly separated by ground lines to minimize problems caused by noise.



Pragmatic Designs IF-1 Interface Card

The IF-1 card is priced at $89.05 in kit form and $119.95 assembled and tested from Pragmatic Designs, 711 Stierlin Road, Mountain View, Calif. 94043

Assembler Built for 8080, Z80

BELLEVUE, Wash. — The Macro-80 from Microsoft, Inc., is the first 8080/Z80 assembler to incorporate almost all "big computer" assembler features without sacrificing speed or memory space, the firm claimed.

The 14K-byte assembler includes a linking loader, library manager and cross-reference facility. It assembles more than 1,000 line/min, the firm said.

Macro-80 supports a complete Intel Corp. standard macro facility; the nesting of macros is limited only by memory, according to the firm.

Code is assembled in relocatable modules while the conditionals may be nested up to 255 levels and include a set of conditional pseudo-operations.

The package sells for $200; it is included with the purchase of the Microsoft Fortran-80. Microsoft is at Suite 819, 10800 N.E. Eighth, Bellevue, Wash. 98004.

MPU, Keyboard and Enclosure

Package Deal Based on S-100 Bus

LOS ANGELES — The Package Deal now being offered by Microdasys is an enclosure/-MPU/keyboard unit that includes a full-sized Ascii keyboard with alpha lock, cursor control and two user-definable keys.

The unit also includes a 16A power supply with enough drive for a full set of S-100 cards and two floppy disk drives, the firm said.

Handles Boards

The S-100 bus motherboard can accommodate any of the hundreds of boards now available for this bus, such as video/graphics boards, processors, music boards, speech boards or I/O cards, the firm claimed.

Priced at $249 in kit form and $299 assembled, the Package Deal is available from Microdasys through P.O. Box 36051, Los Angeles, Calif. 90036.

TI Expands Speak & Spell With Vowel Power Module

DALLAS — Texas Instruments, Inc. has unveiled the Vowel Power plug-in word module to expand the capabilities of its Speak & Spell learning aid.

The module expands the built-in vocabulary of Speak & Spell and contains 140 words, divided into short vowel sounds, long vowel sounds, two-letter or "blends" of vowel sounds and vowel-R sounds.

A book included with the module contains games and activities designed to involve a child "in enjoyable, educational experiences with vowel sounds and patterns," the firm said.

The Vowel Power module will be available for $15 in February frum retailers.

Additional information is available from TI's Consumer Relations Department, P.O. Box 53, Lubbock, Tex. 79408.

Tape Controller Bows For NRZI, PE Formats

CONCORD, Calif. — Zeta Research, Inc. has introduced the MTC-80, a multibus magnetic tape controller that features IBM-compatible read/write capability for both NRZI and phase-encoded formats.

The single-board formatter/controller handles 7- or 9-track tape, at densities of 200-, 556-, 800- or 1,600 bit/-in.

Tape speeds of 25- or 37.5 in./sec are also supported.

The MTC-80 consists of an 8085 microcomputer, two control interfaces, two direct memory access (DMA) channels and buffer memory. It costs $2,250 from Zeta Research at 2300 Stanwell Drive, Concord, Calif. 94520.

Filter Ends Interference

NATICK, Mass. — Electronic Specialists is offering the Power Line Interface Filter designed for use where interference from a microprocessor, teletypewriter or TV game enters the power line.

The 1,000W unit, inserted in the line at the offending equipment, will prevent interference propagation via power lines, according to the firm.

The two conductor kilowatt load costs $15.95 and the three conductor kilowatt load costs $19.25 from Electronic Specialists, Box 122, Natick, Mass. 01760.

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Micro-Based Plan Assists Small Police Departments

(Continued from Page 55)

number of cars for each shift.

Both systems provide information that could never have been obtained before because of lack of time, resources and ability, Copeland noted.

The department will switch from the Pet system to a Radio Shack TRS-80 with 16K bytes of memory, because extra memury is needed to implement Patrol/Plan II.

The programs are written for the TRS-80, the Pet or the Apple Computer, Inc. Apple II, according to Alan Gill, Tippa research analyst. All the programs are written in Basic on cassette tape or disk, but differ slightly to fit each system.

No Standardization

Gill acknowledged that one of the prublems with micros is that each system requires its own programming language and there's no standardization.

He predicted, however, that micro systems will be of enormous assistance to users in local government.

Memory is not really a problem for the ordinary user, according to Gill. Memory is available to expand the system so it can handle almost anything, but if a user wanted to keep and store large memory files he might run into limitations, Gill admitted.

One way of overcoming that problem would be to use a modem to connect the micro with a large system, thus using the micro as a powerful terminal. The micro would do all the computations, but the large system could be used to store any excess data required.

Second System

A second planning system, developed by Tippa apart from the LEAA-sponsored project, is a Schedule/Plan program that permits a user to plan work schedules, days off, vacations and extended hours of service. The system is designed to be used by police, firemen, hospitals, prison guards or vehicle maintenance services.

However, anyone with unique work schedules and special needs could use one of the programs, since they allow the user to develop a wide variety of work schedules, including ones having either five 8-hour shifts or four 10-hour shifts each week, he said.

The research group would like to branch out into other areas as well. "We have lots of ideas, but the problem is getting someone to pay for them," Gill noted.

Tippa invites anyone interested in suggesting new ideas or who would like more information to contact the Institute at Suite 914, 230 Bemiston Ave., St. Louis, Mo. 63105.

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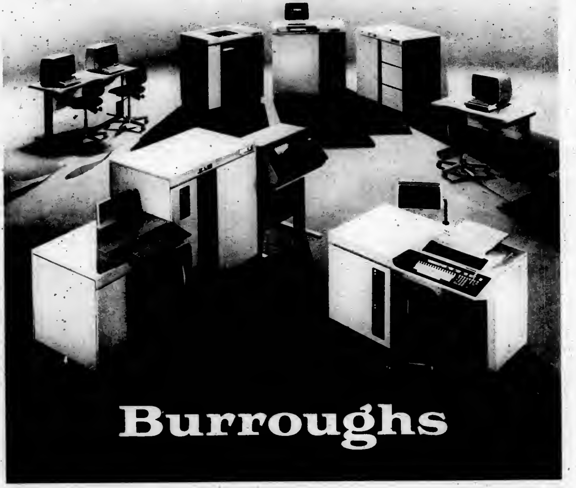

Burroughs

Reasons Not Clear

AM Withdraws Offer to Buy Microdata

By Marcia Blumenthal
CW Staff

LOS ANGELES — AM International, Inc. has withdrawn its offer to acquire Microdata Corp. Interviews with executives at both companies failed to produce a clear-cut picture of why negotiations failed.

Microdata claimed the price of the offer was the primary reason for the breakdown in the negotiations, but a spokesman for AM, formerly Addressograph-Multigraph Corp., said the withdrawal of the offer was unrelated to the price. Wall Street analysts offered mixed opinions.

Microdata learned about the termination of negotiations only when a representative of the National Association of Security Dealers Automated Quotation System telephoned the company before temporarily suspending the trading of its stock, according to Donald W. Fuller, Microdata's chairman and chief executive officer.

In a recent interview, Fuller said he suspected the price of the transaction was the cause of the breakdown in negotiations. AM originally offered to purchase Microdata on a share-for-share transfer basis that would have put a $47 million selling price on Microdata [CW, Nov. 20].

Shareholders Wanted More

However, a group of Microdata shareholders, buoyed by the announcement of first quarter per-share earnings of 60 cents, told Microdata management the AM offer was not satisfactory.

AM's shares have been trading in the $23 to $24 range. The Microdata shareholders were aiming for a price with a multiple of 15 based on yearly per-share earnings of $1.81 to $2.40. These earnings reflect the range of past and future earnings for Microdata, Fuller said. Using the Microdata shareholder formula, the shares shoold have been valued at $27 to $36, resulting in a price substantially higher than that offerd by AM.

Moreover, Fuller indicated that AM made its acquisitiun move in an unusual manner.

"Generally speaking, in mergers of high-technology companies the parties make sure there is a provision for the continuity of management and work out other details prior to the offer," Fuller said. In this case, AM made a formal offer before working out the details, he claimed.

Although Fuller indicated Microdata's current management would have remained if the acquisition was completed, he said the offer "was not well orchestrated." Microdata had not been seeking to become acquired, he observed.

The negotiations were not proceeding quickly enough for AM, Fuller stated, suggesting this may have precipitated the cessation of negotiations. Microdata anticipated holding a special shareholders meeting in March at the earliest, to work out questions stockholders may have had about the merger.

AM Refuses Comment

In commenting on the withdrawal of its offer, Alan Easton, AM vice-president of communications, admitted that the negotiations were not moving rapidly enough for AM. However, that was the only point upon which he and Fuller agreed.

Easton claimed that the negotiations had not even proceeded as far as discussing the price of the offering. "In discussions with Microdata management, pricing never reached the stage of negotiations. It was not a key point," Easton claimed.

When asked what specific issues had bogged down the negotiations, aside from the lengthy time period, he declined to comment.

According tu statements made by AM Chairman Roy L. Ash, AM has been actively seeking an entry into the DP industry. The acquisition of Microdata would have marked AM's entrance into the general-purpose computer segment of the industry. Given AM's professed acquisition program, Eastun was asked why AM could not abide the delay in order to conclude the deal. He

(Continued on Page 60)

Mainframers' Smooth Sailing Puffs '78 Earnings, Revenues

Major mainframers sailed through 1978 puffed by healthy revenues and profits. Compared with 1977, NCR Corp. hoisted its earnings a whopping 61%, Honeywell, Inc. breezed in with a 22% gain and IBM stayed on an even keel with a 14.4% earnings rise.

IBM experienced smooth sailing in 1978 with revenues topping $21 billion, up 16.2% from $13.1 billion last year. Earnings rose to $3.1 billion or $21.29 a share compared with $2.7 billion or $18.30 a share in 1977.

In the final quarter, IBM netted just over $1 bilion or $6.95 a share, a 27.2% increase from 1977 fourth-quarter earnings of $797.3 million or $5.38 per share. Revenues for the quarter passed $6.4 billion, a rousing 27.8% gain on 1977's fourth-quarter revenues of a bit over $5 billion.

"Purchases of data processing equipment increased as the year progressed and in the fourth quarter of 1978 surpassed any other quarter in our history. Purchases for the full year were also at an all-time high," IBM Chairman Frank T. Cary said in commenting on the results.

"While such purchases are expected to continue at a high level, it should be recognized that if the 1978 rate of growth is not sustained, a reduction in the growth of future earnings could result," he warned.

In the fourth quarter, revenue from sales of equipment advanced 45.1% from 1977 results while sales of rentals and services increased 14.4% For the year, sales of equipment pushed ahead 23.5% from fiscal 1977 and rentals and services increased 11.6%.

Without being specific, Cary said that "even with the high level of shipments during 1978, the backlog at year-end increased over the previous year."

NCR Sets Record

NCR earnings for the fourth quarter reached a record $89.9 million or $3.34 a share compared with $54.5 million or $1.91 a share in 1977's final quarter.

Revenues for the fourth quarter totaled $852.9 million, up 19% from the 717.9 million reported for the last quarter of 1977.

Revenues for the year topped $2.6 billion, a 13% increase from 1977 revenues of $2.3 billion. Earnings totaled $193.7 million or $6.90 per share, a whopping 61% gain on the $120.6 million or $4.30 per share earned in 1977.

William S. Anderson, NCR chairman, attributed the company's record performance for the third consecutive year in part to "improved margins resulting from continuing cost reduction programs in our engineering and manufacturing plants, lower interest expense and higher interest income."

Anderson also noted that the company has increased its research and development outlays by 20% during the year. R&D spending reached $138 million for the year, he reported.

Honeywell: 38% Gain

Honeywell's fourth-quarter earnings breezed in with a 56% increase to $76.1 mil-

(Continued on Page 61)

IBM's Latest POS Terminals Greeted by Mixed Reactions

By Marcy Rosenberg
CW Staff

IBM's introduction of two point-of-sale (POS) systems for small retailers (see Page 33) drew mixed reactions from both competitors and industry watchers.

Most viewed the announcement of the 3680 programmable store system from IBM's Data Processing Division (DPD) and the 5260 retail system from the General Systems Division (GSD) as a renewed thrust by the firm into the POS retail market, a market which only recently has started to take off.

Some observers were surprised that GSD would enter the POS market; others noted that the aggressive pricing — in the $3,000 to $4,000 range — by both divisions and their entry into the smaller retail environment could spell strong competition for other suppliers.

Many in the industry, however, minimized the potential impact the products could have in the marketplace.

No Surprise to Sweda

Sweda International, which sells POS equipment ranging from stand-alone electronic cash registers (ECRs) to computer-driven POS terminals with scanning capabilities, soft-peddled the IBM announcement.

The announcement was "no surprise" to the Pine Brook, N.J., vendor and, in fact, "was supposed to have come last year at this time at the National Retailers and Merchants Association annual meeting," according to Emilio Fontana, vice-president of marketing support and product planning.

"We don't expect it to have any significant impact or effect on our sales, mainly because we have a wide range of products available today for that marketplace," Fontana said. IBM 5260 deliveries are expected to start in September; 3680 shipments are slated to begin in February 1980.

Fontana said Sweda's Model 803 intelligent terminal with data collection capability is comparable to DPD's 3680. The basic $3,900 Model 803 is priced competitively with the 3680 series Model 3684 stand-alone terminal that IBM is quoting at $3,950 with diskette, keyboard, CRT and cash drawer, he added.

"In order to be a factor in the POS market, a supplier needs to offer a complete product line, and what IBM is doing is expanding its base," Fontana stated. "You cannot be a via-

(Continued on Page 64)

HP Gets Piece of the Pie

Microdata Admits ADP Unhappy With Minis

By Marcy Rosenberg
CW Staff

IRVINE, Calif. — Responding to rumors that Automatic Data Processing, Inc. (ADP) will phase out Microdata Corp in favor of Hewlett-Packard Co. as supplier to ADP's Business Systems Division, Microdata admitted ADP was not entirely satisfied with its equipment.

"ADP was concerned about the throughput on our equipment and put a lot of heat on us to improve our operating system," Jack Bertch, Microdata's vice-president of sales, disclosed recently.

Microdata has supplied Reality minicomputer systems to ADP since late 1977, when ADP started its Business Systems Division program to provide small businesses with interactive accounting services.

However, ADP's recent contract with HP — for a potential $25 million worth of HP 3000 series small business systems for ADP's on-line accounting service — sparked industry speculation that HP will replace Microdata as hardware supplier to this ADP program.

ADP's deal with HP is "an addition to the Microdata contract rather than a replacement," according tu Richard Patterson, ADP's vice-president of finance. "We expect the Business Systems Division's interactive service to be a successful program, and it would be foolish to have one source of supply."

He emphasized the decision to add HP as a second source had "nothing to do with the termination of merger talks" between Microdata and AM International, Inc. (see story on Page 59).

Patterson also stressed that the contract with HP, similar to the one with Microdata; is an open-to-buy order. "We're under no commitment to take any machines. We have only set the specifications and quantity prices for the hardware and software we want to buy.

"It's not an order in the sense that HP and Microdata are gearing up to provide a specific amount of equipment," he said. "The quantity depends on how many customers we get on this service."

Interactive Services

The Business Systems Division is part of ADP's Commercial Services Division, which provides batch accounting services to small business. The firm started the Business Systems program "to offer these services on an interactive basis," Patterson explained.

Under the program, ADP supplies customers with prepackaged applications software for accounting, billing and inventory control. ADP clients can process data on-line using either the Microdata or HP minicomputers at an ADP regional computer center on a shared basis or installed at the customer's site.

Customers are charged munthly fees determined by the number of files and applications.

"We envision offering the small business interactive computing service on a national basis from our 35 commercial centers across the U.S.," Patterson said.

Asked how much business this service represents for ADP presently, he said his firm originally made available the interactive accounting products in the New York metropolitan area "and several months ago expanded to the Boston area. It is just out of the R&D stage and is not a significant product to us yet."

ADP announced one and one half years ago that it was looking for a second source to Microdata, Patterson said, adding his firm will compare reliability and throughput of the Microdata and HP systems to determine which is suitable for a given customer's application.

Meanwhile, Microdata is "in the process of completing a massive upgrade of its Reality operating system software to a version to give added throughput capabilities, Microdata's Bertch noted.

The firm announced the Version 3.0 firmware/software release to the general public in January 1978, according to Robert Fondiller, Microdata's strategic account manager who handles the ADP account. The 3.0 systems are what the firm calls its Royale series.

ADP requested the 3.0 machines last year because the firm "felt it would be beneficial to improve throughput and get more users on a system," Fondiller said.

Upgrade Program

In September, Microdata started a program to upgrade the Reality systems ADP purchased prior to 1978 because ADP wanted all systems "to be fully compatible" — a process Microdata hopes to complete by the end of the month, he added.

Reality systems are field-upgradable to the Royale version, Fondiller maintained, with the addition of firmware boards for ADP's pre-1978 Reality machines and, depending on the age of the systems, other boards and cables.

No Phaseout Planned

"We have a strong product," Fondiller said, adding Microdata recently signed "a multimillion-dollar contract with ADP that "we're very happy with" and represents "a firm order for Royale systems" that "bodes well for Microdata in its future relationship with ADP." He declined to give further details.

Since 1977, Microdata has shipped systems to ADP at the rate of two or three per month, Bertch noted, "and we expect to increase that volume to four or five every month.

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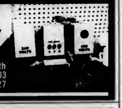

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Bid to Buy Microdata Withdrawn

(Continued from Page 59)

refused to comment.

He also refused to comment on whether any information about Microdata came to light subsequent to the offer which influenced AM's withdrawal. However. Easton refuted Fuller's statement that the approach AM took in making its acquisition offer was unusual.

Eastun said the company would continue its efforts to acquire companies in the computer industry.

Analysts Divided

Similarly, speculation of Wall Street observers was divided. Michael J. Geran, a computer industry analyst with Donaldson, Lufkin & Jenrette Securities Corp., said Microdata's latest quarterly financial results made stockholders feel they had a bargaining position with AM. The price was probably the major reason the negotiations fell through, he concluded.

On the flip side of the record, Bache Halsey Stuart Shields, Inc. issued a report last month that said it "prefers tu assume that AM will not complete the acquisition unless the positive aspects of the merger largely outrank the negative aspects."

Written by Ralph Weil, a vice-president with the investment firm, the report also noted that the financial community has "skeptical views about Microdata which may have been related to its below par relations with the investment community in the past."

Weil pointed to lingering problems of a lawsuit with Pick & Associates, Inc. against Microdata and the poor relationship between Microdata and some of its remaining dealers as other possible reasons AM may have called off the deal.

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IBM Fails to Alter Renegotiation Board Ruling

By Marcia Blumenthal
CW Staff

WASHINGTON, D.C. — IBM has failed in a bid to alter a Renegotiation Board finding that the company realized about $41 million in excess profits doing business with the government in 1969 and 1970.

Established in 1943 and revitalized by legislation 13 times since then, the board is mandated by the Renegotiation Act to review a substantial portion of government contracts to assure excess profits are not made. It is set to expire March 31.

At year's end, the board made a preliminary finding that IBM made excess profits of $14.9 million in 1969 and $26.2 million in 1970. After the ruling, IBM had 25 days to submit its counterargument.

In its final ruling Jan. 17, the board did not change the dollar amount of the excess profit determination, but attempted to explain more fully to IBM why it made the adjustments, according to Harry Van Cleve, a member of the board.

Crux of Controversy

The controversy was sparked by the board's exemption of commercial products sold to the government. Such products are exempt because they are considered to be priced fairly as a result of competition in the open market.

However, the commercial equipment IBM supplies in many federal contracts is leased, not sold, to the government users.

Van Cleve said leased equipment has always come under the board's review and pointed out that IBM has already accepted without challenge previous board rulings of excess profits covering the years 1959 to 1964.

IBM Plans Challenge

In a strong statement from corporate headquarters, IBM indicated it will challenge the board's findings in the U.S. Court of Claims, the arbiter of Renegotiation Board decisions.

IBM noted that the Eastern Regional Renegotiation Board had found no evidence of excess profits in its 1972 and 1973 reviews of the years in question. The regional board made that recommendation to the central board at that time, according to an IBM spokesman.

Because the board did not reopen the IBM case until 1978, speculation has arisen that the board is making a grandstand play to prevent its demise in March. In past statements to the press, Van Cleve has denied this allegation.

Instead, Van Cleve claimed that the board has several cases dating back to 1973 and that it has been difficult to get meaningful accounting information from IBM.

"We disagree with the board's position that the mandatory standard commercial exemption under the Renegotiation Act applies only to purchased products. There is no sound basis for this arbitrary distinction," the IBM spokesman said.

Aside from questioning the jurisdiction of the board, IBM disagrees with the board's accounting methods. In particular, IBM objects to the board's method of allocating research and development costs and selling expenses.

IBM has 90 days to decide whether to petition the Court of Claims for a remedy.

Mainframers Up in '78

(Continued from Page 59)

lion or $3.54 per share compared with the $48.0 million or $2.32 per share earned in the same period in 1977. However, the net included a tax-loss carryforward of $14 million or 65 cents per share.

Revenues for the quarter passed $1 billion, a 24% increase on 1977's fourth-quarter revenues of $831.6 million.

For the year, Honeywell's revenues reached $3.5 billion, a 22% increase from the $2.9 billion in revenues a year earlier. Earnings rose to $201.4 million or $9.41 per share, a 38% increase from the $145.1 million or $6.90 per share earned in 1977.

Revenues from the computer portion of Honeywell's business were $1.3 billion, a 25% increase from the previous year. Operating profit from the computer sector was reported at $106 million, up 34% from 1977.

CSC Inks Pact With Saudi Arabia

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) has signed a $221.5 million contract with Saudi Arabia's Interior Ministry to provide a nationwide computer information system.

Under the five-year contract, CSC will provide all computer and communications equipment, computer programs and buildings for the teleprocessing network. The company will also train ministry employees in the use of the system, CSC said.

Contract negotiations were started last July.

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Adapso Schedules Seminar On Ads, Public Relations

NEW YORK – The Association of Data Processing Service Organizations (Adapso) will sponsor a two-day seminar on advertising and corporate communications in the computer services industry on March 13-14 at the Sheraton-Russell Hotel here.

The seminar will be directed toward management of computer services companies and will include presentations and discussions on media advertising, public relations, visuals and direct mail.

Speakers will include Jack Warner, president of Warner Bicking & Fenwick, an advertising agency here; Lee Levitt, executive vice-president, PR Aids, Inc.; Ed Burnett, a direct mail consultant; and Roy Lloyd, operations manager for Genigrahics.

Fees for the seminar are $275 for Adapso members and $350 for non-members. More information is available from Tom Farewell at Adapso, 1925 N. Lynn Street, Arlington, Va. 22209.

Trade Show Set for Southeast Asia

WASHINGTON, D.C. – The U.S. Department of Commerce will sponsor a trade show this summer to assist U.S. computer equipment manufacturers that want to enter or expand current sales to Association of Southeast Asian Nations (Asean) countries.

The Computer and Peripheral Equipment Exhibition and Seminar will be held July 30-Aug. 3 at the International Marketing Center in Singapore.

The five Asean countries – Singapore, Thailand, Malaysia, Indonesia and the Philippines – are expanding rapidly as import markets for computer and peripheral equipment, the Commerce Department said.

Singapore's import market for computers and peripherals is expected to reach $29 million in 1982, spurred by rising interest in computer technology, general economic expansion and a growing need for replacements.

The minicomputer market in that country is growing an average of 19% per year and will more than double by 1982, according to Commerce. The market for small, medium and large computers is expected to increase an average 13% annually.

Supershorts

General Electric Information Services Co., a GE/Honeywell, Inc. joint venture, began operations this month as a marketer of computing services for GE's' Information Services Division and Honeywell's time-sharing operations in the UK, continental Europe and Australia. Previously, Honeywell distributed GE's Mark III service in those areas. GE owns 84.1% of the new firm; Honeywell, the remaining 15.9%.

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Datatab, Inc., a computer services organization, has acquired the ASI Division of Fisher-Stevens, Inc., which specializes in computerized direct mail marketing for fund-raising applications.

– – –

The Uni-Coll Corp., a remote computing service center in Philadelphia, has opened an office in Washington, D.C., in cooperation with the University City Science Center and Wharton Econometric Forecasting Associates, Inc., both of whom are served by the Philadelphia computer complex.

– – –

Intersil, Inc. plans to build a semiconductor IC manufacturing plant in Ogden, Utah. Construction of an initial 75,000 to 100,000 sq-ft building is slated for late 1979.

– – –

In an expansion move, Wyle Laboratories, Inc.'s Distribution Group will add a division in Orange County, Calif. Named division manager of the new facility was Mike Furman, former director of operations for Elmar Electronics, the group's largest division.

– – –

Centronics Data Computer Corp. moved its field engineering service into a new 25,000 sq-ft facility in Hudson, Mass., doubling the size of its printer repair/refurbishment center and inventory stockroom facilities.

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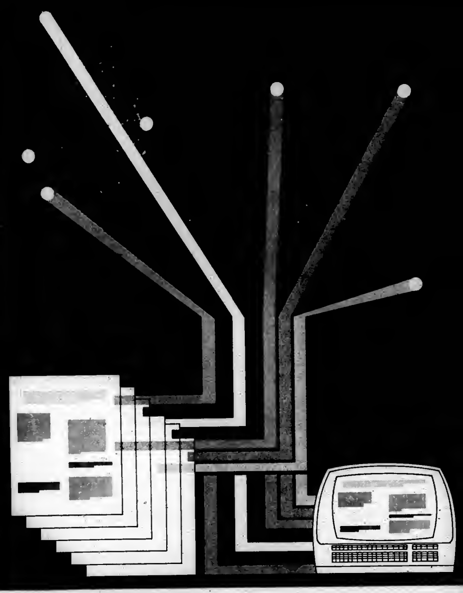

Home Banking Seen Blossoming Market

NEW YORK — The market for computer-based home banking and other transaction services could burgeon into a $7 billion business in the next decade.

The development of home Giro payments services — a combination of post office and banking services — "is a step forward to a full menu of home transaction services," according to a Frost & Sullivan, Inc. market study.

These services will include not only telephone banking, preauthorized debits and credits and direct deposit of payroll, but also retail catalog order entry (remote shopping); educational services, games and amusements; and informational services, such as stock quotations, the survey forecast.

Of these applications, however, bill payments via home terminals will emerge as the fastest growing electronic funds transfer (EFT) service during the 1980s.

Frost & Sullivan predicted more than 4,000 financial institutions will offer this type of bill payment service by 1989. At that time, some 1,535 systems will be installed across the U.S. — about 20 times the 75 such installations reported today.

During the next 10 years, the market for these installations — that is, turnkey systems and front-end processors plus software and peripherals — could hit $473 million, the survey said.

And by the end of 1988, some six million households "will have the capability of two-way interactive communications with a host computer," bringing the potential income from home transaction services into the billions of dollars — potentially greater than for the terminals themselves.

While Frost & Sullivan pointed out the home terminal market is still in the embryonic stage, the study noted several technological developments expected to further the evolution of computer-based home transactions: Giro services, cable TV and direct dial networks.

Currently, scattered U.S. households and small businesses can settle monthly bills via Giro payment transactions coupled to home bill payment services, according to the report. On the horizon, however, are two-way interactive TV networks in which a cable TV set serves as the receiver and a keypad terminal as data entry source.

In this kind of system, subscriber information, once entered, would be stored digitally in an interface unit until polled from a central point.

Potential applications include market research, education, political polling, merchandise ordering, utility meter readings and fire and burglar alarm monitoring, Frost & Sullivan indicated.

Warner Cable Corp. is said to be testing this type of TV network to cover 100,000 households in Columbus, Ohio. A local bank will soon conduct a home banking experiment in which customers pay bills electronically via the cable and get account balance data.

In addition, the planned use of printer devices to copy what appears on the TV screen could presage the ability to bring "banking statements electronically into the home or initiate loan agreements by remote means," the study noted.

Another alternative, direct dial networks, are available to home subscribers with one of three terminal types: a TV set directly linked to phone lines; a "smart" telephone handset that uses an alphanumeric keyboard, CRT and optional cassette recorder or printer; and a microcomputer designed to deliver the same function as a "smart" telephone, but without that capability built in.

Entitled "Home Banking Terminals and Other Applications Market," the study costs $800 from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

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GA Plans LSI Center

ANAHEIM, Calif. — General Automation, Inc. plans to set up an LSI technology and packaging center in Scottsdale, Ariz.

As part of the firm's Micro Products Group, the center will specialize in designing, packaging and eventually manufacturing custom LSI circuits for "future computer products," according to Lawrence A. Goshorn, president and chairman.

The Scottsdale facility, expected to house at least 200 employees by 1982, will include an advanced research and development laboratory, Goshorn said.

Named to head the LSI center as vice-president of micro products was John C. Foster Jr. Foster was southwest regional manager for Fujitsu Ameria, Inc.'s Semiconductor Division, where he established the firm's sales and distribution network in the Sunbelt states.

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EOE M/F

Mixed Reactions Greet IBM POS Terminals

(Continued from Page 59)

ble supplier unless you have more than just high-end computer-driven terminals."

Because IBM — with stand-alone versions in the new POS terminal lines — is going after smaller stores, Fontana believes companies that only supply ECRs will be much more affected by IBM competition than will firms with broader product lines. Sweda has no plans to reduce its prices or change product strategy because of the IBM product introductions.

Similarly, Dr. Robert F. Collings, president and chief executive of Data Terminal Systems, Inc. (DTS) in Maynard, Mass., "is not overly concerned at this time" about the IBM announcement, but he refused further comment. DTS is a major supplier of stand-alone ECRs.

Analysts Expect Impact

While suppliers claim little concern about IBM's move to broaden its POS line, a number of industry analysts are not so optimistic.

"There may be no measurable financial impact on companies like NCR Corp. — the market leader — or DTS in 1979, but it may come in 1980" when volume deliveries of the 3680 and 5260 begin, according to John J. McManus, a vice-president of Shearson Hayden Stone, Inc., securities firm.

The immediate impact is still 'psychological' because IBM has no product available, he said. However, the advance announcement could "freeze orders for other competitors in the market. Retailers may wait to evaluate what IBM comes out with, because they will have to justify new orders of equipment other than IBM's."

NCR, a large company and supplier of a full line of POS equipment, will be "better able to withstand a competitor like IBM than a smaller, narrow-line supplier such as DTS," McManus pointed out.

Effect on DTS

IBM's 5260 retail system — which probably won't be shipped in volume until the first quarter of 1980 — could impact DTS' existing business to the first-time DP user or small retailer, McManus said.

DTS, he added, "is just getting into the large general merchandise retail market, and the 3680 programmable store system could prevent the firm from expanding its market at the high end to large department stores.

What the announcement means is that IBM is becoming more aggressive in POS terminals or terminal-based systems that are industry-oriented — in this case, oriented to the retail business, he stated.

"The whole point here is that what used to be a cash register which sold for $2,600 to $3,000 is now a DP input terminal system that can be sold to the retailer for $7,000 or $8,000 including some proration for ancillary peripheral equipment."

Change in Market

Agreeing with McManus was Gideon Gartner, analyst at Oppenheimer & Co., who said that by selling the new POS systems with peripherals — such as floppy disks instead of cassettes — and offering program products to support the terminals, "IBM is forcing the POS area to be more of a systems sale instead of a stand-alone terminal sale."

He added, however, that this "is not a major negative for NCR," which "has been strengthening its system posture substantially in the retail market."

Several observers called the IBM announcement a move to build up a sagging POS product line that would not significantly impact NCR and other suppliers.

"IBM's penetration into the POS business hasn't been particularly spectacular," according to Bill Becklean of the technology group at Bache Halsey Stuart Shields. "This has been a disappointing sales area for IBM, whose POS products to date have been DP products designed to be part of a network that uses a 370.

"Because those products didn't sell well, IBM relaxed that requirement and began to provide in-store controllers so a 370 wasn't needed to run the system," he commented. Adding two POS lines for the small retailer is IBM's way of trying to correct a product line that is not doing well, according to Becklean.

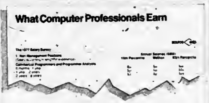
DPD vs. GSD Again

While not attaching much significance to the announcement, Becklean and others nevertheless pointed out that, once again, DPD and GSD will be competing in a new market and that the 5260 retail system is the first POS product to come out of GSD.

GSD's entry into the retail POS market could indicate IBM recognizes a potential market for the small POS user, an area the firm hadn't addressed before, Becklean said.

"GSD is well organized to go after the small account or first-time user, while DPD's 3680 programmable store system is targeted for the major retailer that would buy these things by the hundreds."

POSITION ANNOUNCEMENTS



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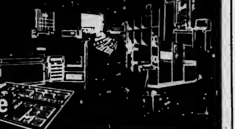

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PROGRAMMING SUPPORT—COORDINATOR: Leadership position assigning, scheduling and coordinating software support activity for a group of 6-8 Systems Programmers. Position will include developing departmental standards for improved software control. Qualifications include demonstrated leadership experience, good communications skills, plus a working knowledge of IBM Assembler language and O/S.

DIAGNOSTIC PROGRAMMER: Position available for an experienced Diagnostic Programmer to participate in development of an on-line diagnostic system for our plug-compatible peripherals. Position requires 3-5 years of experience in diagnostic or systems programming.

SYSTEMS PROGRAMMER: Excellent opportunity for an individual interested in career growth and state-of-the art software. This position includes responsibility for the generation and maintenance of an IBM MVS/JES2 complex in a multiple CPU environment. Qualified candidates will have experience in IBM assembler coding and a working knowledge of O/S JCL, utilities and supervision services. Experience in S/370 SYSGEN, IPO and SMP/PUT system is helpful but not required.

DIAGNOSTIC PROGRAMMER: Outstanding position for an individual interested in diagnostic programming. This position requires experience in diagnostic programming or appropriate hardware training. Experience with IBM systems, including assembly language programming, is highly desirable. Your assignments will include writing diagnostics and engineering checkout software for plug-compatible CPUs.

SYSTEMS PROGRAMMER (OS/VS): Your OS/VS systems programming experience can be your entry to a challenging future in plug-compatible CPU development. A good knowledge of OS/VS features and a working knowledge of IBM assembly language programming is required. Helpful background experience includes dump analysis, SYSGEN, system maintenance, operation and tuning. Your assignments will include performance analysis, analysis of model dependent operating systems modules, programming and compatibility testing. This position also offers an exceptional opportunity to increase your knowledge of IBM software.

SYSTEMS PROGRAMMER (DOS/VS): Use your DOS/VS background to move into the exciting world of plug-compatible CPUs. If you have experience as a DOS/VS systems programmer and have good knowledge of DOS/VS features and a working knowledge of IBM assembly language programming, a challenging opportunity awaits you. Useful experience includes POWER/VS, VSAM, SYSGEN, system operation, maintenance and dump analysis. Your assignments will include analysis of model-dependent operating system components, performance analysis, programming and compatibility testing. This position also offers an exceptional opportunity to increase your knowledge of IBM software.

For immediate and confidential attention, please call or send your resume to

Sue Smith
CONTROL DATA CORPORATION
2200 Berkshire Lane
Plymouth, Minnesota 55441
(612) 553-4720

CONTROL DATA CORPORATION

More Than A Computer Company

An Affirmative Action Employer M/F

ASSISTANT PROFESSOR INFORMATION SYSTEMS

Tenure-track position available fall 1979. Candidates should be experienced in business data processing. Preferred specialities: program languages, systems design, data base management, data communications, and operating systems. Doctorate or ABD in Information Systems or related fields required. The department offers MBA, MS and BS in Information Systems. Please send resume by February 15 to Dr. Norman E. Sondak, Information Systems Department, San Diego State University, San Diego, CA 92182. Equal Opportunity/Affirmative Action/Title IX Employer. College of Business, San Diego State University, San Diego, CA 92182.

SYSTEMS ANALYST PROGRAMMER

COMMERCIAL BANK
$25,000

Active search for experienced (3 yrs) Systems Analyst. Hands-on background with NCR systems & working knowledge of NEAT III/COBOL. Responsible for designing DDA, savings accounts, international functions, general ledger & trust. Full benefits. Call or write EILEEN SHEA at (212) 349-6900

THE BANKERS REGISTER
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SYSTEMS ANALYSTS

PROGRAMMER ANALYSTS

PROGRAMMERS

Exciting opportunities currently exist to join Bell & Howell, a non-aerospace company, in the area of new product development. These opportunities offer qualified innovators, with a proven track record, participation in the development of a new product from its inception. The use of such tools as the PDP-11 and RSX-11/M make successful completion easier to attain.

We offer excellent salaries and comprehensive benefits, including medical, dental, life insurance, profit sharing, credit union, and tuition reimbursement.

For immediate consideration send resume and salary history in complete confidence to:

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BELL & HOWELL COMPANY
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COMPUTER PROFESSIONALS

Valley National Bank, located in the beautiful Valley of the Sun, Phoenix, Arizona, is currently experiencing a staff expansion. Being the largest bank in the Rocky Mountain States, we realize the need for qualified professionals to continue our expansion. We have immediate openings in the following areas:

IBM 379/158&168, OS MVS COBOL TSO/SPF

- **PROGRAMMER/ANALYSTS**

3-5 years programming experience preferred with banking applications experience-DDA and/or TDA.

- **DB/DC PROGRAMMERS**

Minimum of 1 year IBM ALC programming required. Banking applications preferred but not required. MVS, JCL, UCC DMS or CICS desired.

- **SOFTWARE SPECIALISTS**

1-5 years software experience preferred. Program product application, MVS System generation/maintanance, PTF application via SUT/SMP, MVS tuning and performance evaluation, DASD management experience.

If you would like to enjoy the desirable climate and life style that Phoenix has to offer while becoming a part of an employee oriented Bank, send your resume and salary history in confidence to:

Valley National Bank
P.O. Box 71/CW 10 B301
Phoenix, AZ 85004

VALLEY NATIONAL BANK

Valley National Bank of Arizona

Data Acquisition Systems Analyst/Programmer

The Mead Johnson & Company Research Systems Department has an opening for a systems specialist responsible for design and program data-acquisition computer applications for Research and Development activities. Our operating environment includes real-time monitoring and control of scientific instruments functioning concurrently with local or remota batch applications.

You must have a B.S. Degree in Computer Science, Engineering, or Mathematics with a working knowledge of FORTRAN. Experience with programming minicomputers for monitoring and controlling devices is highly desirable, but not required.

Our company is a rapidly expanding midwestern pharmaceutical and nutritional products manufacturing firm with an excellent benefit and compensation program. Qualified applicants should respond in confidence to.

Manager, Executive Employment

MeadJohnson
& Company
Evansville, Indiana 47721
Equal Opportunity Employer M/F

ENGINEER/PROGRAMMER

IMMEDIATE OPPORTUNITY AVAILABLE WITH
CADILLAC MOTOR CAR DIVISION
GENERAL MOTORS CORPORATION

This position will involve real time and batch automotive product development application on a network of DEC PDP 11's.

To qualify you must:

- Have experiance with FORTRAN and RSX11M. (Assembly language and IBM 370 experience helpful)
- Engineering or Computer Science degree.

Excellent General Motors benfits.

Send resume and salary history to:

CADILLAC MOTOR CAR DIVISION
EMPLOYMENT OFFICE 2E
2960 CLARK
DETROIT, MI 49232

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[illegible]

SEARCH E.D.P., INC.

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Dallas, Taxas 75243
Personnel Consultants

Retail DP Minneapolis - St. Paul Systems Development to $22,000

Retail giant, major expansion for 1979. Degree prefered, plus two years 370/OS experience required. Rush your resume or call collect Terry G. Barrett — President, 322 Groveland Ave., Minneapolis, Minnesota 55403 (612) 871-9144

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dp RECRUITERS

Law Enforcement Systems Analyst

Individual will be responsible for transferring automated criminal justice system to Clark County, Washington.

Will report on a daily basis to Systems and Programming Manager of Regional Computer Center and coordinate with and report on a functional basis to criminal justice officials and staff.

Individual should have a good working knowledge of BAL, COBOL, CICS, and DOS/VS.

This position requires a college degree involving major study in computer sciences or closely allied field, or equivalent experience.

Salary
$1,700/month plus benefits
Application Deadline:
February 15, 1979
Send Resume To:
Ray Berry, Director
City/County Data Processing
P.O. Box 1995
Vancouver, WA 98661

COMPUTER PROGRAMMER ANALYST - Private dental university is accepting resumes for an experienced Computer Programmer Analyst with 3 - 5 years business or financial information systems or data base management systems plus on line programming experience. Knowledge of programming languages, systems analysis and program documentation techniques. Responsibilities include to specify, develop, implement, analyze and maintain computer programs that will support patient accounting and other financial information. Mail resumes to: **University of the Pacific, School of Dentistry, Att: Lee Ann Trumbull, 2155 Webster Street, San Francisco, California 94115.** An Affirmative Action Equal Opportunity Employer.

PROGRAMMER ANALYST

An Iowa based electronic manufacturer of integrated retail information systems for the pharmaceutical, food and retail industries has an opening for a Programmer Analyst. You will design and write applications and test procedures, for our product line. Responsibilities include designing, coding and implementation of programs for our computer register and order entry product lines; and providing good documentation for new programs and program changes. Must have BS in Computer Science and basic assembler language required. Minicomputer experiance a plus. This position offers excellent compensation of $653.85 biweekly with a 40 hour work week, plus outstanding opportunity for personal growth and achievement. Please send complete resume to:

Job Service
Of Iowa
P.O. Box 729
Cedar Rapids, Iowa 52406

Equal Opportunity Employer M/F

PROGRAMMER/ PROGRAMMER ANALYSTS

A recent reorganization has created openings for Programmers and Programmer Analysts to work on a variety of business applications. Successful candidates will have one to three years programming experience and knowledge of COBOL.

We offer an attractive benefit package and the opportunity to work with IBM 370 equipment using the latest techniqses - TSO, IMS, CICS, MVS.

Replies will be held in strictest confidence.

Please send resume and salary requirements to:

Mr. Robert P. Hart
Director of Personnel
Carrier Corporation
P.O. Box 4800
Syracuse, New York 13221

Carrier Corporation

AN EQUAL OPPORTUNITY EMPLOYER

SYSTEM ANALYST/ PROGRAMMER ANALYST

Our expanding data Processing Division has existing openings for qualified Systems Analysts and Programmer Analysts in our large EDP development effort.

The individuals we seek will have responsibilities in design, development and implementation of large-scale health care systems.

These positions require:

Solid background in programming and system design.
COBOL programming
O/S JCL
General knowledge of advanced IBM 370 hardware and systems software, OS/VSI, CICS, VSAM.

We offer the opportunity for diversified experience and rapid growth, along with excellent salary and substantial benefits.

Please call (501) 378-2176 or send a detailed resume and salary history to:

Peronnel Manager

Arkansas Blue Cross and Blue Shield, Inc.

801 Gains Street
Little Rock, Arkansas 722d3

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Data Processing Professionals

Opportunities Available At All Levels
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***168 OS/MVS JES 3**
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***Production Support**
***Accounting/Banking**
***Data Base Technology**
***ISAM/VSAM**
***IMS & DATACOM DB-DC**
***NCSS/TSO**
***COBOL**
***ALC**
***PL 1**

These are San Francisco-based positions offering exceptional benefits and salaries to 30K. Respond to 1390 Market Street, Suite 910, San Francisco, CA 94102. Or call (415) 622-2031. EOE, m/f/h.

Decimus Consulting Services

Immediate Opening For Director Of Computer Services

As administrative and technical director of all computer activities within the college, interfaces with all administrative levels in responding to institutional objectives and departmental needs, including those related to research, planning, and development and is responsible for computer personnel management, programming, and operations. Bachelor's degree in Computer Science or equivalent (Master's preferred), Bachelor's degree in Business Administration (or equivalent), and four years minimum work experience in field, at least two of which involved administrative experience, preferably related to education. Salary: Administrative catagory; commensurate with qualifications and experience. **Send resuma by March 15 to Charles Martinez, Coordinator, Management Information Systems, Texas Southmost College, 80 Fort Brown, Brownsville, Texas 7952d.** T.S.C. is an Affirmative Action, Equal Opportunity Employer.

CUSTOMER ENGINEERS
Based in Fairfield New Jersey

Rapidata is a recognized leader in the computer services industry providing financial information services to Fortune 1000 companies. We are currently seeking qualified Customer Engineers

In-House Hardware Support Group

RESPONSIBILITIES:

On-site maintenance servicing in-house computer equipment.

QUALIFICATIONS:

Several years experience as a technician, preferably on a medium or large scale computer system. Must possess a good working knowledge of test equipment, digital and logic circuits. Prior experience on ITEL, DEC or Honeywell equipment a plus.

Field Service-Communications Processers

RESPONSIBILITIES:

Repair of communications processors and components in a lab environment and be an important member of our progressive team - where individual contribution is quickly noted and rewarded.

QUALIFICATIONS:

A minimum of 2 years experience on repair of communications processors, inclusive of integrated circuit experience, and free to travel.

We offer excellent company benefits, including 100% tuition refund and salaries fully attuned to your qualifications. Please call or send resume with salary history and requirements to Mrs. **W. Hamilton, Rapidata, P.O. Box 1049, Fairfield, N.J. 07006.**

(201) 227-0035

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rapidata

CALIFORNIA

SAN FERNANDO VALLEY

Major mfg needs 3 Programmer/Analysts for their expanding shop. Firm has 370/158 MVS going to 3033 Strong knowledge of OS Utilities and COBOL required Salary to $21,000

CENTURY CITY

Nat'l service organization seeks Sr P/A with 370/OS/COBOL experience Benefits include stock option, dental plan & bonus system. Salary to $23,500

SOUTH BAY

Consumer goods mfg needs Systems Coordinator to interface between parent company and DP executives Environment — 370/135 DOS, COBOL & RPG. CICS knowledge is helpful Salary to $30,000

WEST LOS ANGELES

Div. of major mfg. corp seeks several Programmer/Analysts to design & implement mfg. systems including BOMP, MRP, Shop Floor Controls & Inventory Controls. The system configuration is a 370/158 OS/VS1 with an IBM 3033 to be installed by March. Salary to $26,000.

the jarvis walker group

11222 S La Cienega Blvd Inglewood Ca 90304
(213) 670-7353

FACULTY POSITIONS IN COMPUTER INFORMATION SYSTEMS

Bentley College is expanding its undergraduate degree program in Computer Information Systems as well as planning to implement a Master's Degree Program in the Fall of 1979.

Therefore, the Computer Systems Department is accepting applications from individuals who have a commitment to teaching excellence.

- Policy Formation in Management Information Systems
- Computer-Based Information Systems
- Management Information Systems and Control
- Small/Mini Business Computer Systems
- ANSI, COBOL, BASIC, and FORTRAN
- Distributed Information Systems Processing
- Data Communication
- File Organization and Structures
- Techniques of Simulation of Information Systems
- Business Systems Analysis and Design
- Computer Auditing and Controls
- Computer Applications in Finance

Doctorate in hand or near the final stages of completion preferred. Consideration will be given to Master's Degree holders with experience. The positions become effective September 4, 1979.

Send a current resume, and the names, addresses, and telephone numbers of at least 3 references to:

Dr. John H. Burns, Dean
Bentley College
Beaver & Forest Sts
Waltham, MA 02154

Bentley College
Beaver & Forest Sts
Waltham, Ma 02154/(617) 891-2000

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Technical and Management Opportunities in:

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Mgr. D.P. Resources	$36-42K
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Systems Manager	$34-38K
Systems Anl/Progs.	$26-29K
Tecn. Sup. Mgrs.	$26-32K
Soft Des & Engr.	$20-28K
Prog. Analysts	$20-28K

TECHNICAL

Engr. Mgr. CAD/CAM	$30-40K
EE Microproc Mgr.	$20-28K
E Digital Des	$25-30K
ME Develop.	$25-30K
Instru Prod. Mgr.	$25-30K

SALES

Branch Mgr -Soft	$45-50K
MRP Software	$40-50K
Core Mem OEM	$35-40K
Plotter	$28-35K
Hardware	$35-40K

Numerous local and national positions not listed! Include present salary, minimum salary requirement, location, and flexibility with resume

MARVEL CONSULTANTS
3690 Orange Place
Cleveland, Ohio 44122
(216) 292-2855

Professional Employment Service.

Programmer Analysts

South

[illegible]

[illegible]

SEARCH E.D.P., INC.

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All replies answered

CITY OF KEENE
NEW HAMPSHIRE
POSITION AVAILABLE
Director of Data Processing

Highly responsible technical position involving the administration, control and design of data processing activities under the direction of the City Manager. Responsible for coordinating the data processing activities of the various City Departments and other outside governmental agencies.

Requires knowledge and experience in RSTS/E and BASIC language and in the operation of a Digital PDP 11/40. Prefer Bachelors plus four years experience or Associate with six years experience. Salary $19,000 range negotiable. Applications and resumes will be accepted in the City Manager's Office, 3 Washington Street, Keene, NH 03431, until 5:00 PM, February 23, 1979.

The City of Keene is an Equal Opportunity Employer M/F.

Consider an Enhancement to Your Program with a Software Development Opportunity.

The chances are you have accomplished a great deal in software areas. And you enjoy being at the forefront of technology with an industry leader. Amdahl would like to offer you an opportunity to build on your skills and explore opportunities that may not have been available to you in the past. We have created a software development environment that will allow you to work independently and as part of a team on meaningful projects. Projects where your efforts will be realized in software products that will help to write the next chapters in computer systems evolution.

Within the next few weeks, we will be in your *local area* to meet with you. Please call Phil Beckhelm at 800/538-8460 x6165 (toll free) to arrange a confidential interview appointment.

Amdahl Corporation is located in the San Francisco Bay area at 1250 East Arques Avenue, Sunnyvale, California 94086. We are an equal opportunity employer.

LOCAL INTERVIEWS FOR SUNNYVALE, CALIFORNIA POSITIONS

Here's where we'll be:

City	Date
Washington, D.C.	February 16-17
Rhinebeck, N.Y. (Hudson Valley)	February 16-17
Raleigh, N.C.	February 18-19
Boston	February 18-19
Chicago	February 18-19

MVS DEVELOPMENT PROGRAMMERS

Our Software Development Group affords opportunities for individuals with:

- A broad base of competence in MVS concepts and operation
- In-depth experience with one or more of these areas: Supervisors, Storage Management, IOS, VTAM, TSO, Data Management (VSAM), and JES 2/3

This environment provides an ideal opportunity for experienced programmers to improve MVS performance on current and future systems.

VM DEVELOPMENT PROGRAMMERS

Our Software Development Group offers additional opportunities for experienced professionals with:

- A broad base of competence in VM/370 concepts and operation
- In-depth knowledge of one or more areas: VM/370 Control Program (CP), Conversational Monitor System (CMS), Net-Working, VM/SE; and VM/370 installation and functional characteristics
- Knowledge of Assembler and System/370 architecture
- Familiarity with Control Programs operating with VM/370

VM/370 projects will require highly knowledgeable designers who will identify areas that are candidates for performance and reliability enhancements. This is an exceptional opportunity for creative systems programmers to influence the future direction of VM/370 and to make it a product that will truly live up to its full potential.

amdahl

FLORIDA OPPORTUNITIES

NCR NEAT/3 PROGRAMMER

Experienced NCR Century Programmers. Salary commensurate with expetience. Excellent company paid benefits including free lunch and parking. Ample prime shift test time. Send resume or call

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SYSTEMS ANALYSIS--FLORIDA

We are a large health care subsidiary of a Fortune 500 corporation, located in Florida and serving the southeastern U.S. We seek a degreed systems analyst/programmer with specific experience on Data General equipment: Eclipse series COBOL, INFOS, and IDEA. Previous knowledge of the health care environment is a plus, including patient and doctor billing, insurance claims submission, and the like. Our hardware will include several on-site mini-computers and numerous remote printers. Ability to program in several languages is desirable, with emphasis favoring on line operations.

A strong business orientation is required, along with excellent communication skills. Salary commensurete with experience. Please send resume with salary history to

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Promotion has created critical spot with client averaging 40% annual growth. Ideal for the individual with a solid track record in ODP and/or communications sales. High visibility.

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Co-ordinate efforts of advanced corp. software development group to soonist. network users. Very little travel. Must be able to communicate effectively with technical and user staffs. One plus yrs. VS & BISynch can qualify you. Prime Fla. location, excellent benefit PKG.

PLUS

SALES/SALES MGT./SE'S
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Clients pay all fees, relocation, and interview costs. For information and interviews on these and other "move ahead" positions call or write JOHN CUMMINGS of our firm:

FRANK LEONARO PERSONNEL
1211 No. Westshore, Suite 100
Tempe, Fla. 33607 813-872-1253

WANTED COMPUTER PROFESSIONALS FOR FLORIDA

OUR CLIENTS UROENTLY NEEO:

PROGRAMMERS/ANALYSTS fluent in Spanish	to $25K
MINI-COMPUTER PROGRAMMERS/ANALYSTS with high level clearances	to $30K
ANO WE ARE LOOKING FOR:	
IMS, MVS, AND OTHER SOFTWARE EXPERTS	to $35K
NCR Programmer/Analysts	to $25K
P/A's with bank, financial, commercial experience	to $30K
TELECOMMUNICATIONS and TELEPROCESSING specialists	to $35K
REAL-TIME PROGRAMMERS, Minis and Micros	to $30K
These are just a few of our openings	to $55K

If you plan a trip to Florida in the coming months, contact us in advance to arrange interviews. Otherwise, send a resume or call collect:

MS. LOUIS RESNICK

DATA SCIENCES PERSONNEL, INC

15490 N.W. 7 Ave.
Miami, Florida 33169
305/585-7291

CORPORATE STAFF MANAGEMENT INFORMATION SYSTEMS
FLORIDA LOCATION

Harris Corporation is an established Fortune 500 leader in communications and information handling equipment. Dua to the growth of a new corporate MIS Dapartment, we have the following professional career opportunities at our Melbourna, Florida Corporate Headquerters:

COMMUNICATIONS PLANNING/PROJECT MANAGER

We ara seeking an individual who can plan, design and implament a world wide data communications natwork. You will be responsbile for consulting, equipment selection, network configuretion and development of long renge integrated communications network. You should possess a degree, preferably in Computer Science or Electrical Engineering plus a minimum of five years experience in a computer network anvironment with responsibility for planning, design, installation operation and maintenance of hardwara and software elements (i.e. telecommunications software, hardware terminals, communication front end equipment, network controllers, modam deta sets and transmission systams.

DATA STORAGE ADMINISTRATOR

You will be responsible for tha devalopment of a multibillion character disc storege environment including implementation of automated disc management system. You should be degreed with minimum of 2 years experiance in a medium to large scale IBM OS environmant. Experience with automated disc end tape storage systems with strong COBOL and BAL programming skills required.

CUSTOMER SERVICE COORDINATOR

You will be responsible for assisting our decentralizad divisions in: resolution of problems, analyzing job stream requiramants, work flow scheduling end design and analysis of date base systams. You should possess a degree plus 2 yaars experience in business systams and COBOL programming, preferably in an OS JCL environment.

SYSTEMS PROGRAMMER

You will be responsibla for assisting our divisions in plenning and converting from a MVT, to MVS System. You should possess a degree plus 2 yaars axperience with MVS and JES2 or JES3 internals with prior MVT experiance. Systems Programming on larga scale IBM systems required.

SENIOR PROGRAMMER ANALYST

You will ba responsible for assisting our divisions in the programming and application of business systems softwara. You should possess a degree. Knowledge of IBM, OS/VS, HASP and with data base remote batch and transaction processing desirable.

In addition to excellent, salary, benefits and liberal relocation assistance, these ara high visibility, growth situations in ona of the nations most desirabla locations.

For immadiata consideration, please forward resume and salery history to Harris Corporation, Manager of Corporate Staffing, Melbourna, Florida 32919.

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Programmers FLORIDA

MANUFACTURING
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All Types Needed*

DOS COBOL	to$17K
with BAL or CICS	$1[illegible]K
OS COBOL	to$17K
OS/VS BAL & CICS On Line	to$20K
VM Systems Programmers	to$21K
DOS/VS Systems Programmers	to$21K
IMS Application Programmers	to$25K
NCR Neat 3 Levels 1 & 2	to$21K

Many more unlisted, some require only 1 yr experience minimum****
Current employment not jeopardized,
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Michael Ladd, Dept. C, Suite 255
5401 W Kennedy Blvd, Tampa, Fl 33[illegible]

INFORMATION SYSTEM MANAGER

Miami based multi million dollar firm has an immediate opening for an individual desiring e challenging opportunity to design, develop and manage e real time information system. System development entails a full spectrum of applicetion, including MIS, Financial, Madical, Insurance and Bank functions. Knowledge of remote communications and experience with Mini-computers preferred. This position offers competitive compensation and comprehensive benefit program. Plaase send salery history and requiraments to

CW Box 1822
797 Washington St.
Newton, MA 02160

FLORIDA
COMMUNICATION SYSTEMS DEVELOPMENT

LEADING DATA PROCESSING COMMUNICATION and PERIPHERAL MANUFACTURER located in the SUNSHINE STATE is looking for TALENTED PROFESSIONALS who are interested in DESIGN and DEVELOPMENT (NOT MAINTENANCE) of COMMUNICATIONS SYSTEMS SOFTWARE. Experience in the areas of BINARY SYNCHRONOUS COMMUNICATIONS (BSC) on 16 BIT MINI COMPUTERS or 270X/2780/3780/3275 or HASP WORK STATION using ASSEMBLER LANGUAGE is DESIREABLE. SALARY to $30,000. Please submit RESUME including SALARY HISTORY or CALL:

HARRY EDWARDS
1211 N. WESTSHORE BLVD., SUITE 100
TAMPA, FLORIDA 33607
813-877-9140

FLORIDA
WEST COAST
SYSTEMS PROGRAMMER

Expertise in DOS/VS, CICS/VS, POWER/VS and Assembler, COBOL and banking experience desirable. Rapidly growing operations going from IBM S/3 to S/370. All replies strictly confidential. **Send resume to:**

Paul W. Shafer
Financial Data Services, Inc.
P.O. Box 1118
Englewood, Fla. 33533

PROGRAMMER ANALYST

Expanding our staff · Seeking Programmer Analyst with 2 to 3 years heavy BAL experience. Requirements are in both batch and online environments.

Excellent COMPANY PAID fringe benefit program which includes medical/dental/life insurance, profit sharing, business ensembles, lunches, parking allowance, vacation, etc.

Please send resume to Personnel Department, Dade Federal Savings, 101 East Flagler Street, Miami, Florida 33131.

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Dig out of the Yankee blizzards. Follow Sunny Southern opportunities. Our fine clients are suffering growing pains and their professional MIS departments need you now!

Sr Prog/Anl to 25K
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Time Share Anl to 28K
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Prog/Anl to 22K
B2700-B4700, COBOL

Prog/Anl to 22K
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Technical proficiency qualifies you for a place in the sun. Update that old resume and call J. Lefkowitz collect at 305/891-4801. Corporate Advisors, Inc., 12955 Biscayne Blvd., Miami 33181.

FLORIDA

OPPORTUNITIES

MIS Analyst Marketing/ Sales

Martin Marietta Aluminum, a leader in the aluminum industry, has an immediate opportunity available for an MIS Analyst to handle the needs of our coporate Marketing Services Department, headquartered in Bethesda.

Working directly with our internal Data Systems group and marketing management, you will assist in the design, development, and implementation of new and revised MIS systems. In addition to developing and maintaining long range systems plans, you will insure the integrity of departmental data bases and develop instruction programs to guarantee uniform training.

This position requires the skills of a technical data processor with an aptitude for marketing. You must also have experience or education in computer science, preferably accompanied by a degree. Good communications skills and demonstrated problem solving abilities are also essential.

We offer a competitive compensation package and outstanding company benefits. For prompt consideration, please forward a complete resume in confidence to: W. D. Means, Manager, Employee Relations, Martin Marietta Aluminum, 6801 Rockledge Drive, Bethesda, Maryland 20034. We are an equal opportunity employer, m/f.

MARTIN MARIETTA

MARTIN MARIETTA ALUMINUM

DALLAS

PROG/ANALYST positions available NOW by industry application. All are IBM shops and long term clients of DPC

Oil/Gas, DOS/VS COBOL	to $33K
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Airline Supplier, OS COBOL	to $20K
Communications, OS COBOL	to $22K
Life/Casualty Ins. DOS/VS COBOL/ALC	to $22K

Suite 1109 Stemmons Tower W
Dallas TX 75207 (214) 637 6360

DATA PROCESSING CAREERS inc

PROGRAMMER ANALYSTS

The University of Maryland Baltimore County is currently seeking two (2) Programmer Analysts.

UMBC, along with the other U of Md. campuses, is in the process of developing a University-wide distributed data processing network. These positions offer an excellent opportunity to participate in a state-of-the-art DP project incorporating telecommunications and data base management techniques. Knowledge of COBOL required; structured programming and DBMS techniques desirable. Starting salary approx. $17,000.

Outstanding work environment and use of multi-faceted athletic facilities; State of Md. benefits package includes retirement, hospitalization and medical; paid vacations and holidays; and tuition remission plans.

UMBC is located at Exit 12 West of the Baltimore Beltway in close proximity to I-95 and the Baltimore-Washington Expressway.

UMBC PERSONNEL Dept.
5th Floor, Admin. Bldg.
5401 Wilkens Avenue
Baltimore, MD 21228
UMBC is an Affirmative Action/ Equal Opportunity Employer

Performance Analyst

Broadly diversified energy systems company, Combustion Engineering runs one of the most advanced state-of-the-art data processing and communications networks currently in operation.

We are searching for a skilled systems performance analyst to carry out diverse projects in hardware and software performance measurement/analysis and capacity planning. The environment consists of an AMDAHL 470/V6-II and an IBM 3033.

Appropriate experience will include the application of sophisticated statistical analysis techniques, modeling, simulation, queuing theory and operations research toward the identification of system bottlenecks, component capacities, correctness of configuration and operational philosophies.

Located at our Corporate Computer Center in Windsor, Connecticut, this position offers an excellent starting salary and a full range of benefits. For prompt, confidential consideration, forward your resume including salary history to H R KAIN, COMBUSTION ENGINEERING, 200 Pigeon Hill Road, Windsor, Connecticut 06095

COMBUSTION ENGINEERING
The Energy Systems Company

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COMPUTER PROFESSIONALS
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TRAINEES

WE OFFER:

A unique opportunity for Computer "Pro's" and trainees to return to Ireland and still enjoy competitive salaries with challenging data processing work.

OPENINGS INCLUDE:

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IBM 360/370 Operations Knowledge, JCL Knowledge, Good Technical Programming Knowldge for Technical Support.

Junior Trainees:

To be trained in U.S. and Ireland in IBM operations; some familiarity with computer operations. Will support or market, based on personal preferences and performance.

We offer excellent benefits, travel, exciting prospects of future growth, and a chance for a high standard of living back in Ireland.

In confidence, submit your resume and salary history to:

Value Computing, Inc.
300 VCI Building
West Marlton Pike
Cherry Hill, N.J. 08002
609/429-4200

EDP Opportunities

Our needs are clear.
We need DP talent — Your talent.

Fidelity is expanding its Hayward based Data Center. As a result of this expansion, positions are available for Senior Programmers, Systems Analysts and EDP Auditors. The challenge is in meeting our growth with technical expertise and management skills.

Your recent experience should include IBM 370 DOS/VS utilizing assembler language. Financial background a plus.

Fidelity offers excellent salary and a full range of benefits. If you find a fast-paced, changing environment necessary, let's talk. Call **(415) 271-1755,** or send resume to **H. Marsh, 2323 Shattuck Avenue, Berkeley, CA 94704.**

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SOFTWARE RESEARCH & DEVELOPMENT OPPORTUNITY

Pansophic Is Seeking An Expert In Software Systems Troubleshooting. . . .

Pansophic's impressive growth record, a direct result of the success experienced by its innovative systems such as Easytrieve and Panvalet, has opened-up a ground floor opportunity for a specialist in the area of software technology to move into major systems development efforts.

This key position at our Research & Development Center has responsibility for the on-going support and follow-up maintenance of software products. The focus is on troubleshooting and updating existing products with some future involvement in the development/testing of product enhancements. The top candidate will need 2 years BAL programming and either 1 + year experience in DOS/VS Internals or a 1 year background in OS/VS Internals that includes a year or more exposure to TSO.

. . . To Move Into Major Systems Development Assignments!

This position represents the ideal growth vehicle for the career-minded Software Specialist seeking the creative latitude available in a highly professional and sophisticated R & D environment. Excellent salary and benefits package includes relocation assistance to our ultra modern headquarters complex located in one of Chicago's most attractive suburbs. For confidential consideration send resume and salary history to Tarie Yee, Pansophic, 709 Enterprise Drive, Oak Brook, IL 60521 or,

Call Collect
(312) 986-6026

PANSOPHIC

Equal Opportunity Employer M/F

DATA PROCESSING SYSTEMS AND PROGRAMMER ANALYSTS

We're a major division of Clark Equipment Company, one of the world's leading manufacturers of heavy industrial equipment, with outstanding career opportunities available for individuals who seek constant challenge and strong growth potential. If you would like to excel in a sophisticated, progressive EDP department, consider the following positions

SYSTEMS ANALYSTS

The ideal candidate will possess a BS Degree or its equivalent in Business, Computer Science or related discipline with 3-5 years experience in design and implementation of business systems, with specific experience in finance and or manufacturing systems a plus. Ability to relate well with all levels of management is essential and experience using either IBM or Honeywell equipment is desirable

PROGRAMMER/ANALYST

This position is responsible for the design, coding, testing and documentation of a variety of programs. A bachelor's degree is preferred with at least two years experience in job control language, COBOL, timesharing, remote job entry and/or transaction processing. Experience with Honeywell series 6000 hardware will be essential

As a member of the Axle Division, you will enjoy a position with high management exposure, promotional opportunity and a competitive salary and benefit package. If qualified please send resume with salary history to

C. A. Woodburn
Manager Salaried Relations

CLARK EQUIPMENT COMPANY
Axle Division
324 E. Dewey
Buchanan, Michigan 49107

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CLARK
Axle Division

DEC SYSTEM

10 & 20 Specialists

American Management Systems is a rapidly growing computer services firm with headquarters in Arlington, Virginia. AMS' Computer Center operates two IBM 370/165s and last year added its first DEC-20. The growth in our DEC business has exceeded our expectations and we have now added a second DEC 20 and have plans to add a third in late 1979. To keep pace with this expansion we are seeking candidates for two key positions:

MANAGER OF DEC TEHNICAL SERVICES

Salary to $40,000

This individual will direct a four-person team to provide all software support for our DEC 20 operation. In addition, he/she will contribute to planning for our future hardware needs. Candidates should have extensive experience working with DEC 10/20 software and hardware and should possess:

- In-depth knowledge of current DEC 10/20 software
- Proven management and leadership ability
- Experience in working with clients/customers and in resolving customer service problems
- Experience in doing computer analysis and planning

DEC SYSTEMS PROGRAMMER

Salary to $30,000

This individual should have several years experience with the following:

- DEC 10/20 Internals
- DN-64
- PDP-11 Communications
- COBOL, MACRO, APL, FORTRAN
- System 1022
- Tuning and Enhancing
- Dual Machine Environment

AMS is a nationwide company that has earned a reputation for excellence. Our success has been based on attracting and keeping people who are good at what they do and like the challenge of growing with a growing company. We pay competitive salaries, offer a comprehensive benefits pacakge and pay relocation expenses.

Send resumé to:
Judith D. Ross
Manager, Professional Recruiting

ams

AMERICAN MANAGEMENT SYSTEMS, INC.
Department 791
1515 Wilson Boulevard
Arlington, Virginia 22209
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IDAHO

Banking Applications Programmer. Burroughs B-2800 COBOL environment.

Bank applications programming experience required. Burroughs medium system experience - on-line environment desireable.

Geographical area offers wide range of outdoor opportunities. Centrally located between Sun Valley, Yellowstone and Grand Teton National Parks.

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Mini Soft, PL/1	$20k

2624 E 21st St Tulsa OK 74114
(918) 747-3621

DATA PROCESSING CAREERS Inc

Senior Analysts

Join our growing retail organization!

Expansion of the excellent data processing facilities in our St. Louis corporate headquarters has created openings for four additional Senior Analysts

Our DOS/VS shop is equipped with CICS major on-line systems, including IBM 370 145 twin units.

Qualified candidates will have a minimum of 6 years' experience, preferably in a retail organization, with thorough knowledge of COBOL and/or Assembler language, and must be able to assume project responsibility.

We offer one of the best compensation packages in the business, and growth opportunities to the Project Manager level. For consideration, send a detailed resume and salary history in confidence to

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MIS Manager

High Volume Electronic Business Machines

NCR's Engineering & Manufacturing Division in Millsboro, Delaware has an immediate need for a MANAGER of MIS.

The Manager of MIS will be involved with:

- Development and implementation of manufacturing systems; i.e.; Bill of Materials, Standard Routing, On Line Inventory Control, etc.
- State-of-the-art knowledge of On-Line Real-Time Systems and Data Base Management Systems MISSION (Manufacturing Information System Support Integrated On-Line). An advanced Data Base Management System which can be used as a single- or multiple-plant system for the complete control of an industrial company's manufacturing operations.
- In house hardware which includes NCR's Criterion Systems one of the most advanced state-of-the-art mainframes

The Manager of MIS should have the following background

- Management or supervisory experience - will supervise a group of 10 professionals and associated technical support people and report direct to the General Manager.
- Prefer a BS degree with 5 years experience with at least 3 years in management.

If you are interested in pursuing a career with a growing division, start by calling or send resume with salary requirements to: Mr. Joseph G. Buskirk, Engineering & Manufacturing, Millsboro, Dept. F50, NCR Corporation, P.O. Box 607, Millsboro, Delaware 19966. (302) 934-8111.

NCR

Complete Computer Systems

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PROGRAMMING

SENIOR PROGRAMMER ANALYSTS SENIOR SYSTEMS PROGRAMMER

Rexham Corporation, a large NYSE manufacturing firm with corporate headquarters in Charlotte North Carolina has immediate openings for two Senior Programmer Analysts and a Senior Systems Programmer each with 3 or more years experience.

Our challenging environment includes:

- Centralized corporate data center serving 20 remote locations.
- Univac 90/60 computer system currently expanding to provide new system in FINANCIAL and MANUFACTURING areas.
- Small core of computer science professionals dedicated to installation of quality software.
- Opportunity for growth with a young department in a dynamic company.

We require:

- A Bachelors degree in mathematics, computer science, engineering, or a related field.
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- Cobol, JCL and file structure experience for application programmers.
- Prior experience with Univac VS/9 or IBM 370/OS a definite plus.

These positions offer excellent salaries commensurate with skill and experience, good benefits and outstanding opportunity for professional growth and development. Send full resume including salary history to:

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PERSONNEL MANAGER
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KELSEY-HAYES, one of America's leading suppliers of new automotive equipment and replacement parts, provides fertile ground for strong career growth. We design and manufacture wheels, brakes and anti-skid systems for cars and trucks. Our record-setting sales have created career positions for a Systems Analyst, Applications Programmer and a Systems Software Programmer at our Corporate Data Center.

The **SYSTEMS ANALYST** is responsible for project management of all phases of systems development from systems planning to implementation of commercial applications.

The **APPLICATIONS PROGRAMMER** is responsible for performing the technical design, coding, testing and implementation of the computer portion of the application in a COBOL, DOS/VS, 370/148 environment.

The **SYSTEMS SOFTWARE PROGRAMMER** is responsible for all phases of software planning, evaluation, selection, generation, implementation and tuning of DOS/VS, CICS, ETSS II, DMS, POWER RJE, BTAM, PANVALET and TOTAL. Knowledge of Assembler language is required.

Years of experience and education will be considered but are not as important as knowledge, ability and a track record of accomplishment.

We offer an excellent starting salary and provide a complete benefit program. If you are interested in moving into a bright career with a dynamic, growing organization, please send your resume to:

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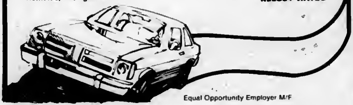

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COMPUTER PROFESSIONALS

American Bankers Insurance Group in Miami, Florida is seeking EDP Professionals who can provide systems and programming support for our user and sales organization.

Applications are now being taken for the following positions.

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Minimum of 2 years experience using COBOL with BAL a definite plus. Financial or accounting programming desirable

PROGRAMMER/ANALYST

Extensive experience in COBOL programming with CICS exposure.

PROGRAMMER ANALYST - SR. PROGRAMMER

Two or more years experience using Assembler; life insurance experience an added advantage

TECHNICAL SUPPORT ANALYST

Experienced in hardware/software problem analysis and system generation/maintenance

SYSTEMS ANALYST

Systems and Programming design experience, interface orally and in writing with all levels of senior management. A high visibility position which requires senior level ability

We are operating with twin IBM 370/148 under DOS/VS and CICS. Our center is located across from a beautiful country club in Miami, Florida in an informal working atmosphere.

We offer an excellent compensation program with paid relocation, in-house training facilities for career development, and excellent benefits. For immediate consideration and to schedule an interview, send a letter or resume to

Richard M. Reynard
AMERICAN BANKERS INSURANCE GROUP
600 Brickell Avenue
Miami, Florida 33131

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Professional Development Specialist

A chance to strengthen and manage a high visibility professional development program at one of the largest corporate computer organizations in the country.

If you're a Professional Development Specialist in a data processing organization with 5 or more years experience and wish to move to the top development spot, this is for you.

We're the Midwestern-based data systems division of a leading high technology FORTUNE 100 corporation, providing data processing services to multiple divisions. We are seeking a person with managerial abilities who has a good working knowledge of education techniques and methodologies, and a good systems orientation, capable of developing a total professional development and training plan for technical and management skills.

For prompt consideration of your qualifications, send resume and salary history in strictest confidence to:

CW Box 1820
797 Washington St.
Newton, MA 02160
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Programmers/ Systems Analysts

The Measurement Research Center of Westinghouse Learning Corporation (WLC), the largest processor of standardized educational tests and a leader in providing high-quality and responsive data management services to the educational community, has a number of outstanding job opportunities available for Programmers and Systems Analysts.

Job responsibilities include analyzing, designing and implementing new systems and enhancing existing systems. You will have an opportunity to implement systems using software packages such as CICS, TOTAL, TSO, PANVALET. Knowledge of any of these would be an asset.

To be considered for these positions, you must have a computer science or information science background and a BS degree or equivalent. Salary is commensurate with experience.

These positions are located in Iowa City on U.S. Interstate I-80 in a modern building with free parking at the door.

To move into a challenging position that offers real job security, top fringe benefits and an excellent location, send your resume, including current salary, in complete confidence to:

Mr. Ferguson Mills
Manager, Employment & Compensation

Westinghouse Learning Corporation
P.O. Box 30, Dept. 777
Iowa City, Iowa 52240

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Westinghouse

Computer Engineer to join the faculty of Electrical Engineering Department at the University of Southwestern Louisiana. Experience in computer hardware design and its application to engineering problems. Ph.D. in Electrical Engineering or Computer Engineering desired with demonstrated research ability. Accomplishments should include publication and participation in professional organizations. He or she will teach and conduct research. *Salary is open. The University of Southwestern Louisiana is an Equal Opportunity Affirmative Action Employer and is in compliance with Title IX and Section 504 of the Rehabilitation Act.* Mail resume to: William A. Kles, USL P.O. Box [illegible], Lafayette, LA [illegible]

GET OUT OF THE URBAN GRIND GET IN ON THE GROUND FLOOR!

The Opportunity:

Cornell University is significantly upgrading its data communications facilities. You will provide the technical leadership for implementing and tailoring state-of-the-art technology to fit Cornell's present and future needs. Knowledge of real-time programming techniques and link protocols is essential. Previous packet network experience, a strong electronics background, and 370 programming experience are definite pluses. Experience with VM/370 or 370S software would be helpful. As a senior staff member you will contribute both ideas and technical talent to the design and implementation of the data network.

The Place:

Cornell University is located in the beautiful Finger Lakes region of upstate New York. The region offers great summer and winter sports possibilities. The Teleprocessing and Small Computer Support Group is a young organization dedicated to providing inexpensive, technically advanced data communications and micro-computer support to the Cornell computing community. The benefits package is attractive and Cornell is an Affirmative Action employer.

Please send your resume to Richard Alexander, OCS - Langmuir Lab, Cornell University Research Park, Ithaca, N.Y. 14853, or call (607) 256-7516. Call today.

PROGRAMMER ANALYST

Expansion has created this new position in our DP department for an individual who has 4 or more years in computer programming with application design and development experience. Qualified candidates will be competent in BAL and PL-1 (or COBOL) in an IBM 360/370 environment. CICS/VS experience a plus.

Our Own Hardware Company is a rapidly expanding wholesale hardware supplier to 950 plus independently-owned retail hardware home center and lumber dealers in the midwest.

Please send resume with salary history or call COLLECT (612) 890-2700.

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Well-known computer software firm seeks Sales Rep to market one of the most popular USER packages on the market today. Reqs bkgd in DP - knowledge of OS-DOS & excellent communication skills. $35,000 earnings possible first yr + liberal expense allowance.

Above represent partial list of active Atlanta & nationwide searches. All fees paid by hiring cos. Send resume in cont, including salary & geographical reqmts, to Ron Spang or call (404) 393-0933.

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Atlanta, GA 30346

DATA PROCESSING MANAGER

Sunbelt Region

THE COMPANY . . .

South Carolina division of a major U.S. corporation, the company is a manufacturer for the automotive aftermarket, and is currently undertaking a basic operating strategy designed to double sales volume within three years.

THE POSITION . . .

Job responsibilities cover the total controls and development of all data processing applications on the System 3 Model 15D computer installation, with particular emphasis on the provision and further expension of detailed management feedback to assist top management decision-making.

THE INDIVIDUAL . . .

The successful applicant will possess an impressive hands-on track record in respct of both DP technical know-how and top management responsibility in a similar installation. Good experience of IPfCS, BOMP is essential, and the position will appeal to the individual who has the confidence in his/her ability and self-motivation to establish a first class DP service for a demanding management team.

REWARDS . . .

Salary in mid-$20's plus bonus Company hospitalization, retirement plans are excellent.

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We Require

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Preference will be Given Candidates Having:

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- Data base design and coding experience.
- Burroughs Systams experiance.

Send resume or phone:
Mr. Michael Kasky
Detroit Personnel Dept.
314 City-County Bldg.
Detroit, MI 48226
(313) 224-3718

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INDEPENDENTS

data processing

Fortune 50 Programming

We're a leading midwest DP services firm currently working on long term system and program development projects for one of the world's largest manufacturing concerns, not to mention our other requirements. These projects call for professionals with broad experience in COBOL or PL-1 programming under IBM OS/VS and IMS or CICS. Candidates must be capable of stepping immediately into significant responsibilities.

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DATA COMMUNICATIONS

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Design and development of disk access methods for IBM 370 hardware. Ideal candidate will have thorough knowledge of BSAM, BDAM, ISAM, or VSAM and to be experiended in EXCP level I/O to disk. Previous software design experience is a plus.

Bisync Communication

Design and development of Bisync communications support 2780, 3780, HASP workstation, 3275 and 3271 on a 16 Bit minicomputer. Ideal candidate will heve worked with Bisync support of at least one of these devices.

Transaction Processor Development

Assist in design end development of e transaction processor similar to IBM's CICS. IBM assembler language experience necessary. Experience with CICS's very helpful.

Diagnostic Programming

Design and develop diagnostic routines for memory, processor, I/O chennels end peripherals. Ideal candidate will have done diagnostic routines for a 16 or 32 Bit machine.

Systems Programming

Support of IBM opereting system and Paradyne software products. IBM operating systems and VM/CMS, DOS/VS and VSI. Ideal candidate will have had experience as a systems programmer on at least one of the IBM systems and must be familiar with interrupt handling on 370/303X CPU's.

Mini Computer Applications

Modify and maintain opereting systems for Floppy Disk and Hard Disk systems. Write programs for communications applications. FORTRAN is e plus.

Microprocessor Applications

Dasign end implement microprocessor software for communications system control and on-line diagnostics. Knowledge of microprocessor hardware design is desirable. Experience with TI 9900 is e plus.

DIGITAL HARDWARE DESIGN

Paradyne also has several Hardware positions available in design of data communications equipment. Knowledge of IBM 370 rype control units, microprocessor controllers or modem design is required.

Technical Writers (Software)

Interface with engineers and programmers to develop user software manuals. Applicants should have solid background in computer science/electronics and a minimum of 3 years writing experience.

Let us tell you more about Paradyne's dynamic organization. Please call collect to our Personnel Office or send e deteiled resume including salary history to:

PARADYNE CORPORATION
8550 Ulmerton Road
Largo, FL 33541
(813) 536-4771

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paradyne
Paradyne Corporation

SYSTEMS ANALYST/ PROGRAMMER

Degree in computer science with 4 years experience on various computers, operating systems and languages. Knowledge of microprocessors and some project leader experience essential. Duties: project planning, systems analysis, computer program development, implementation and integration of complete operational system, documentation and project reporting. $21-$23K.

Call or send resume to
Tami Miller, IOCS,
400 Totten Pond Rd.,
Waltham, MA 02154.
(617) 890-2299

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Systems Designs -
Retail Oriented
$25,000 - $28,000 Salary

A profitable, growing, 12-store, midwestern chain of large retail sporting goods stores wishes to develop and implement their first EDP "TOTAL - SYSTEM," to include inventory control, general ledger, accounts payable, and payroll. Responsibilities will include (1) evaluating management's present system plan, (2) developing recommendations for the purchase of all hard and software, (3) designing forms and procedure manuals, and (4) ultimately, implementing and maintaining THE SYSTEM. Applicant must have a solid EDP background with some programming experience. Experience preferred in retail and point of sale terminals. Forward resume to:

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Peoria, ILL 61602

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E-Systems is a $347 million international corporation whose sales have doubled in the last five years. To keep pace with our fantastic growth, we are looking for career-minded people that want to share our success. We offer excellent salary and a great benefits package, plus the chance to work on some of the most exciting and challenging problems of our time.

We have standing openings that support our continued progress in high technology business associated with the Department of Defense and other government organizations typically for specialized receiver, data processing, antennae, direction finding/emitter location, and audio/digital voice processors.

If you are interested, please send your resume with salary history to: Employment Manager, E-SYSTEMS, INC. Garland Division, P.O. Box 226118, Dallas, TX 75266. Or call: (214) 272-0515.

E-SYSTEMS
Garland Division

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IBM ASSEMBLY LANGUAGE

Programmers

This is an exceptional opportunity for Data Processing professionals to join a $1.8 billion financial institution with a reputation for innovation and growth in a highly competitive marketplace.

We have several newly created Assembly Language programmer positions at different levels for Application Development under VM/CMS on an IBM 3031.

You should have a minimum of 3 yrs. experience in Data Processing, preferably with IBM 370 DOS/VS and a Savings & Loan or banking background.

San Diego offers the best of recreational and cultural activities — the best of cities — the best of climates. If this kind of working and living environment interests you, please send your resume to:

James J. Short
Vice President/D.P. Mgr.
SAN DIEGO FEDERAL
SAVINGS & LOAN
P.O. Box 81266
San Diego, Ca. 92138

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DIRECTOR/MANAGEMENT SYSTEMS

Outstanding opportunity for the professional who has a strong background in the management of systems development and implementation. Ideally you will have experience with data base management and data communications preferably in a retailing or distributing environment. This experience as a professional should be of 8-10 years in duration; at least 2 years of which should be at the director level.

Educational background must include a Bachelors Degree with further education desirable.

You will be responsible for managing the design, development, implementation, maintenance and operation of new and existing operational and management information systems. Related management activities include the supervision of a professional staff of 20, customer and interal training programs and development of internal management systems.

Ours is a national company doing business in 49 of the 50 states with Corporate Headquarters in Minneapolis, Minnesota, with annual sales volume exceeding $150M.

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Operators	**Programmera**

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Preference will be given to individuals with the following experience (operations or management)

Hardware
IBM 370 168, 158, 360 3033, 3032, 3031, Amdahl V5

System Software/Access Methods
OS MVS, OS VS2 JES 2 JES TSO, TSO SPF

Application Software
Languages COBOL, MARK IV etc
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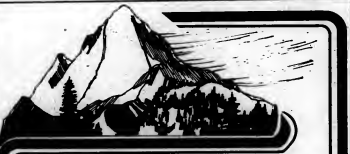

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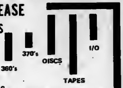

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A pre-submittal, question and answer session will be conducted at Bellevue City Hall, 111 116th Ave SE, 3rd floor conference room on January 24, 1979 at 10:00 A.M. All interested parties are urged to attend.

Detailed information pertaining to this RFP are available from the City of Bellevue Purchasing Division, at the address above. (phone (206) 455-6842).

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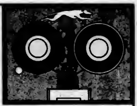

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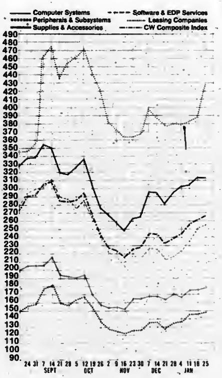

Earnings Reports

BOLT BERANEK & NEWMAN
Three Months Ended Dec. 31

	1978	a1977
Shr Ernd	$.01	
Revenue	8,458,000	$6,838,400
Earnings	8,600	(123,800)
6 Mo Shr	.03	
Revenue	17,181,900	13,810,700
Earnings	35,300	(273,000)

a-Restated.

BURROUGHS
Year Ended Dec. 31

	1978 (000)	1977 (000)
Shr Ernd	$6.21	$5.31
Revenue	2,460,002	2,126,822
Earnings	253,364	215,180
3 Mo Shr	2.75	2.32
Revenue	786,058	670,134
Earnings	111,354	94,074

CAMBRIDGE MEMORIES
Three Months Ended Dec. 2

	1978	1977
Shr Ernd	$.10	$.11
Revenue	2,450,000	2,106,000
Tax Cred	41,000	97,000
Earnings	180,000	208,000

COMPUGRAPHIC
Three Months Ended Dec. 30

	1978	1977
Shr Ernd	$.82	a$.55
Revenue	55,403,000	38,137,000
Earnings	4,061,000	2,572,000

a-Adjusted for two-for-one stock split in June 1978.

HONEYWELL
Year Ended Dec. 31

	1978 (000)	1977 (000)
Shr Ernd	$9.41	$6.90
Revenue	3,547,760	2,911,093
Tax Cred	10,820	10,813
Earnings	201,360	145,124
3 Mo Shr	3.54	2.32
Revenue	1,032,980	831,651
Tax Cred	14,032	2,095
Earnings	76,067	48,648

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 24, 1979

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1978-79 RANGE (1)	CLOSE JAN 24 1979	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	42 1/8	-2	-4.0
N	BURROUGHS CORP	59- 87	71 1/2	-1 2/8	-2.9
O	COMPUTER AUTOMATION	15- 44	25 3/4	+ 1/4	+1.0
N	CONTROL DATA CORP	23- 44	38 3/4	+ 3/4	+2.0
O	CRAY RESEARCH INC	8- 33	30	-1	-3.2
N	DATA GENERAL CORP	42- 21	64	- 1/8	-0.1
N	DATAPOINT CORP	39- 75	72	- 1/4	-0.3
N	DIGITAL EQUIPMENT	39- 58	54 7/8	-2	-3.5
N	ELECTRONIC ASSOC.	2- 15	2 5/8	+ 3/8	+0.9
A	ELECTRONIC ENGINEER.	9- 18	12 1/4	+ 1/4	+2.0
N	FOUR-PHASE SYSTEMS	19- 44	35	+1 1/8	+3.3
N	FOXBORO	28- 40	31 1/2	-1 1/8	-3.4
O	GENERAL AUTOMATION	7- 26	15 1/2	- 7/8	-5.5
C	GRI COMPUTER CORP	1- 5	1 1/4	- 1/8	-9.0
N	HEWLETT-PACKARD CO	62- 95	89	-1	-1.1
N	HONEYWELL INC	43- 20	22 3/4	-2 3/4	-5.6
N	IBM	236-314	308 1/2	-1 3/4	-0.5
O	MANAGEMENT ASSIST	9- 29	20 3/4	+ 1/4	+1.2
O	MANUFACTURING DATA S	9- 23	21 5/8	+ 1/2	+2.3
O	MICRODATA CORP	10- 23	19 3/4	+1 3/4	+9.7
O	MINI-COMPUTER SYST	4- 8	5	+ 3/4	+17.8
O	MODULAR COMPUTER SYS	7- 12	16 5/8	- 3/8	-2.2
N	NCR	37- 70	68 5/8	+ 1/8	+0.1
N	PRIME COMPUTER INC	20- 43	31 7/8	- 3/8	-1.1
N	PERKIN-ELMER	17- 30	28 3/8	+ 5/8	+2.1
N	SPERRY RAND	33- 49	47 7/8	+ 1/8	+0.2
A	SYSTEMS ENG. LABS	11- 24	15 1/4	0	0.0
O	TANDEM COMPUTERS INC	13- 37	28 1/4	+ 1/2	+1.8
A	WANG LABS.	12- 36	34 3/4	+1	+2.9

LEASING COMPANIES

EXCH		1978-79 RANGE (1)	CLOSE JAN 24 1979	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	19 1/2	0	0.0
O	COMDISCO INC	5- 22	19 1/4	+1 1/4	+6.8
A	COMMERCE GROUP CORP	1- 1	1/4	+ 1/8	+100.0
A	COMPUTER INVSTRS GRP	1- 2	4	+ 1/8	+3.2
O	CONTINENTAL INFO SYS	5- 15	7	+ 1/2	+7.6
P	DATRONIC RENTAL	1- 3	2 1/8	0	0.0
A	DCL INC	3- 5	4 1/2	0	0.0
N	OPM. INC	6- 14	10 5/8	- 1/8	-1.1
N	ITEL	16- 36	24 1/2	- 3/8	-1.5
N	LEASCO CORP	29- 57	57 3/8	+2 1/8	+6.0
O	LEASPAC CORP	1- 4	2 1/2	+ 1/8	+5.2
A	PIONEER TAX CORP	3- 7	3 5/8	+ 1/4	+7.4
N	U.S. LEASING	13- 20	14 3/4	0	0.0

*EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		1978-79 RANGE (1)	CLOSE JAN 24 1979	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	8- 22	14 5/8	+ 3/8	+2.6
A	APPLIED DATA RES.	8- 17	12 1/8	- 1/8	-1.0
N	AUTOMATIC DATA PROC	24- 36	30 1/4	0	0.0
O	COLEMAN AMERICAN COS	1- 2	1/2	0	0.0
O	COMPU-SERV NETWORK	5- 12	7 1/4	0	0.0
O	COMPUTER HORIZONS	1- 9	6 1/4	- 1/4	-3.8
O	COMPUTER NETWORK	6- 14	6 5/8	- 1/8	-1.8
N	COMPUTER SCIENCES	8- 12	12 5/8	+ 1/4	+2.0
O	COMPUTER TASK GROUP	1- 5	5	0	0.0
O	COMPUTER USAGE	2- 4	2 7/8	+ 3/8	+15.0
O	COMPUT AUTO REP SVC	4- 10	7 1/8	0	0.0
O	COMSHARE	6- 19	17 1/4	+ 3/4	+4.5
O	CULLINANE CORP	19- 33	21 1/4	+1 1/4	+6.2
O	DATA DIMENSIONS INC	4- 8	4 7/8	- 1/8	-2.5
O	DATATAB	1- 2	2 1/8	+ 1/4	+13.3
N	ELECTRONIC DATA SYS.	15- 25	20	+ 1/4	+1.2
O	INSYTE CORP	1- 3	1 1/8	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3 1/8	+ 1/8	+4.1
O	KEANE ASSOCIATES	3- 6	5	+ 1/4	+5.2
O	KEYDATA CORP	1- 3	2 1/2	+ 1/8	+9.2
A	LOGICON	10- 19	13 1/8	+ 5/8	+5.0
A	NATIONAL CSS INC	15- 36	28 3/8	- 5/8	-2.1
O	NATIONAL DATA CORP	7- 13	9 3/4	+ 3/8	+4.1
A	ON LINE SYSTEMS INC	12- 30	17 1/8	- 5/8	-3.4
N	PLANNING RESEARCH	4- 10	4 5/8	+ 1/2	+8.1
O	PROGRAMMING & SYS	1- 1	1 1/4	+ 1/8	+11.1
O	RAPIDATA INC	3- 7	5 1/8	+ 3/8	+7.8
O	REYNOLDS & REYNOLDS	19- 36	27 1/2	+ 1/4	+0.9
O	SCIENTIFIC COMPUTERS	3- 9	7 3/4	0	0.0
O	TYMSHARE INC	18- 35	30 1/8	- 7/8	-2.8
A	URS SYSTEMS	5- 8	6 1/2	- 1/8	-1.8
N	WYLY CORP	1- 7	5	- 3/8	-6.9

PERIPHERALS & SUBSYSTEMS

EXCH		1978-79 RANGE (1)	CLOSE JAN 24 1979	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	23 7/8	- 5/8	-2.5
O	ADVANCED MEMORY SYS	7- 18	14	0	0.0
N	AMPEX CORP	10- 18	16	+ 3/4	+4.9
O	ANDERSON JACOBSON	5- 10	6 1/4	+ 3/8	+6.3
N	APPLIED DIG DATA SYS	9- 22	11 5/8	- 1/8	-1.0
O	BEEHIVE INT'L	3- 7	4 5/8	+ 1/4	+5.7
A	BOLT,BERANEK & NEW	6- 14	11 1/2	- 1/8	-1.0
N	BUNKER-RAMO	10- 20	17 3/8	- 5/8	-3.4
A	CALCOMP	3- 13	6 5/8	- 1/8	-1.8
O	CAMBRIDGE MEMORIES	3- 9	5 1/4	+ 1/8	+2.5
N	CENTRONICS DATA COMP	16- 57	53	0	0.0
O	COGNITRONICS	1- 4	1 1/2	+ 1/4	+20.0
O	COMPUTER COMMUN.	4- 7	7	+ 5/8	+9.8
O	COMPUTER CONSOLES	4- 10	8 1/2	+ 1/2	+6.2
A	COMPUTER EQUIPMENT	3- 6	4 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 5	5	+ 1/2	+11.1
O	COMPUTERVISION CORP	9- 30	28 1/2	+5 1/4	+12.3
O	CONTEN	9- 38	21 1/2	-1 1/4	-3.4
N	CONRAC CORP	13- 24	14 1/4	+ 1/4	+1.2
O	DATA ACCESS SYSTEMS	3- 16	11	+1	+10.0
O	DATA 100	9- 20	19 1/2	0	0.0
A	DATA PRODUCTS CORP	14- 29	18 1/4	- 1/8	-0.6
O	DATUM INC	2- 4	3	- 1/4	-7.6
O	DECISION DATA COMPUT	2- 8	3 1/2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
A	DOCUMATION INC	6- 34	22 1/4	-1 1/4	-5.3
O	DATARAM CORP	6- 32	10 1/2	0	0.0
N	ELECTRONIC M & M	4- 9	6 7/8	0	0.0
O	FABRI-TEK	1- 2	1	-	-5.9
O	GENERAL COMPUTER SYS	1- 3	2 3/8	+ 3/8	+18.7
O	GENERAL DATACOMM IND	9- 21	15	+1 1/4	+9.0
N	HAZELTINE CORP	10- 12	13 3/8	+ 1/2	+3.8
N	HARRIS CORP	17- 36	30 5/8	-1 3/4	-5.4
O	INFOREX INC	6- 11	9 1/4	+1	+12.9
O	INFORMATION INTL INC	7- 12	10	+ 3/4	+8.1
O	INFOTON	1- 3	3	- 1/8	-4.0
O	INTEL CORP	39- 62	50	+ 1/2	+0.8
A	LUNDY ELECTRONICS	4- 8	8 1/8	- 1/4	-4.6
O	MSI DATA CORP	10- 18	12 7/8	+ 1/4	+1.9
N	MEMOREX	27- 39	32 5/8	-1	-2.9
N	MOHAWK DATA SCI	6- 19	10 7/8	+1 3/8	+14.4
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 12	12 1/2	0	0.0
O	PENRIL CORP	5- 12	11 1/4	+ 7/8	+8.4
N	PERTEC CORP	9- 17	10 5/8	-1 1/4	-10.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 8	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	8 5/8	- 1/4	-2.8
O	SCAN DATA	1- 5	2 5/8	0	0.0
N	STORAGE TECHNOLOGY	19- 46	33 3/4	+ 1/2	+1.5
O	T BAR INC	11- 20	19 1/4	+1	+5.4
O	TALLY CORP.	6- 14	10 1/4	+ 1/4	+2.5
A	TEC INC	6- 13	6 3/4	- 3/8	-0.4
N	TEKTRONIX INC	13- 54	53 3/8	+1 5/8	+3.1
N	TELEX	1- 8	6 1/2	+ 1/2	+8.5
O	TESDATA SYSTEMS CP	9- 23	12 1/2	+ 1/4	+2.0
O	WILTEK INC	1- 2	5/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1978-79 RANGE (1)	CLOSE JAN 24 1979	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	8 5/8	+ 5/8	+7.8
C	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 34	32 1/4	- 3/4	-2.2
O	CYBERMATICS INC	1- 1	5/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	12 3/8	+ 1/2	+2.9
N	ENNIS BUS. FORMS	8- 17	13 5/8	+ 5/8	+4.8
N	3M COMPANY	47- 66	63 5/8	- 5/8	-0.9
O	MOORE CORP LTD	26- 34	29 1/4	+ 1/4	+0.8
N	NASHUA CORP	18- 57	28 1/2	+3	+12.7
O	STANDARD REGISTER	20- 27	23 3/4	0	0.0
A	TAB PRODUCTS CO	8- 18	13 3/8	+ 1/8	+0.9
N	UARCO	19- 52	51 3/8	+ 3/8	+0.7
A	WABASH MAGNETICS	10- 22	15	- 1/2	-3.2
N	WALLACE BUS FORMS	18- 33	24	+ 1/8	+0.5

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Management Science America, Inc.
3445 Peachtree Rd.N.E., Dept. C-1
Atlanta, Ga. 30326/(404) 262-2376
Telex: 549638 Answerback: MSA ATL
Chicago (312) 986-2450/Los Angeles
(213) 822-9766/New York (201) 874-4700
International Agent: MSA International,
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